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ABSTRACT

This text provides material for the individualized instruction of students training in the area of sporting goods retailing and merchandising or some closely related area. It consists of nine assignments dealing with fishing equipment and 13 assignments devoted to hunting equipment. Covered in the individual assignments are the following topics: fishing and the American angler; types of game fish; fishing rods, reels, lines, lures, and accessories; terminal tackle; the role of the fishing tackle salesperson; the development of hunting as an American sport; competition shooting; the role of the hunting equipment salesperson; the role of the firearms salesperson; shotguns and shotshells; rifles; rifle cartridges; selling reloading equipment and components; and accessories for hunters and shooters. Competency-based in approach, the lessons contain objectives, technical information, review questions, and suggested projects. (MN)

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Sporting Goods

Fishing and Hunting Equipment

By
W. O. (Dan) Smith

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Foreword

This publication is a revision of a previous one entitled *Sporting Goods, Fishing and Hunting Equipment*, 1970. The new publication provides the material for individualized instruction for students training in the area of sporting goods retailing and merchandising or some closely related area.

The publication is competency-based. The competencies identified in the Lynch study under a contract from the U.S. Office of Education and those identified for competition by DECA have been used extensively as the basis for the assignments. The information in the assignments provides the knowledge (cognitive) competencies. The application and synthesis of the competencies is derived by the student from the completion of the learning activities and from daily tasks performed on the job.

This publication is very flexible. Assignments can be given in any sequence and can enhance and supplement instruction. They can be assigned as students need to acquire certain knowledge and attitudes. The entire publication can be used as the basis for a course of instruction by the teacher-coordinator.

The content and projects are the work of Dr. W. O. (Dan) Smith, teacher-educator for Marketing and Distributive Education at Angelo State University, San Angelo, Texas. Dr. Smith brings together his experiences in teaching with his knowledge of curriculum development. He has also had many opportunities to use the knowledge and skills developed from his avocation, sport fishing. The Center is indebted to Dr. Smith for sharing his skills and knowledge in the preparation of this publication.

Jack E. Robertson, Director
Center for Occupational Curriculum Development

Acknowledgments

This Center deeply appreciates the assistance of Allen Christenson, who has provided a thorough review and validation of the fishing portion of this publication on *Sporting Goods*. Mr. Christenson has a unique blend of industry knowledge which he has applied in a wide range of professional experiences. He has successfully been involved in all phases of store operations, including buying, merchandising, promotion, supervising employees, and accounting. He is also a licensed fishing guide and has participated in numerous sport fishing competitions. Mr. Christenson currently manages the Bass World Tackle Shop in Austin, Texas.

The Center also recognizes the contribution of Dr. Carl Heather of Austin, Texas, for reviewing portions of the manuscript on the subject of guns and hunting equipment.

This Center is grateful to the following manufacturers, companies, and other sources that have allowed illustrations from their publications to be used or adapted for use in this manual. They are the American Fishing Tackle Manufacturer's Association, Chicago; *1978 Lew Childre & Sons Catalogue*, Foley, Alabama; *1979 Eagle Claw*, Wright & McGill Co., Denver; *Outdoor Life*, April, 1980, and September, 1979, Jim Carmichel's "The Hunting Rifle," New York; *Fly Casting*, by Jim Green, Fenwick publication, Westminister, California; U.S. Bureau of Alcohol, Tobacco, and Firearms; *New Hunter's Encyclopedia*, Stackpole Books, Harrisonburg, Pennsylvania; Winchester-Western Co., New Haven, Connecticut; *Remington Sporting Firearms and Ammunition Catalogue*, du Pont Co., Bridgeport, Connecticut; Speer Inc., Lewiston, Idaho; Mayville Engineering Co., Mayville, Wisconsin; RCBS, Inc., Oroville, California; *W. R. Weaver Catalogue*, El Paso, Texas; Savage Arms, Westfield, Massachusetts; Smith & Wesson, Springfield, Massachusetts; Colt's Firearms Division, Colt Industries, Hartford, Connecticut; Federal Cartridge Corporation, Minneapolis, Minnesota; and The Browning Manufacturing Co., Morgan, Utah.

Special thanks are expressed to Al Kelm and Oshman's Sporting Goods Store, Jay McBride and McBride's Gun Store, and the sporting goods department at Montgomery Wards in Austin for their cooperation and assistance in the production of this book.

Competencies and Content

for *Sporting Goods, Fishing and Hunting Equipment*

In order to enter and progress in jobs in sporting goods marketing, you will be required to develop and use many skills. You may already use some of these skills both at home and at work. Other more specialized skills and competencies relate only to your tasks at work. Let's take a look at some very basic skills you should know and be able to use as you enter employment.

The first list of basic skills describes activities you will need to perform with accuracy and courtesy to benefit you, your customer, and your employer. The second list of social skills will also benefit the customer and employer, but they will benefit you most.

Working to become proficient in these areas will increase your opportunities for success and advancement. You may want to use the list to predict your job performance. As you progress and learn and become more proficient in one area, check it off and work on other skills that you need to develop. The more skills you master, the more your chances for successful performance are enhanced.

BOTH ENTRY LEVEL AND MIDMANAGEMENT LEVEL

Basic Skills

Utilize basic skills in the application of marketing functions.

- Use legible handwriting in preparing forms, messages, and records.
- Listen attentively to directions, assignments, and information from customers, supervisors, or managers.
- Communicate verbally with customers, employees, supervisors, suppliers, and others.
- Communicate verbally with groups, including firm personnel, civic organizations, and others.
- Read reports, forms, policies, product information, and other written information.
- Compose and complete correspondence, reports, forms, and notes.
- Perform mathematical computations applicable to marketing functions in this occupational area.
- Use the telephone correctly and courteously.
- Use calculating equipment to perform mathematical computations.

Social Skills

Demonstrate appropriate social skills in terms of self-development.

- Demonstrate good work habits, such as punctuality, orderliness, and patience.
- Demonstrate effective work habits by planning and scheduling work tasks and assignments (time management).
- Maintain good appearance and health.
- Demonstrate appropriate ethics, such as integrity and honesty.
- Adjust and adapt to new and unique ideas and situations.
- Convey a positive self-image and represent the firm in a positive way.
- Assume responsibility for individual actions and/or department and company operations.
- Maintain a positive attitude toward individual responsibilities and/or department and company operations.

- Accept constructive criticism and take appropriate corrective actions.
- Maintain necessary endurance, forbearance, and persistence to accomplish goals and objectives.
- Display appropriate sense of humor.
- Budget time effectively by managing leisure, work, and home affairs in ways that enable individual goals to be achieved.
- Use success or failure constructively in a work situation.
- Be dependable in the work environment.

Demonstrate appropriate social skills in relations with others.

- Work cooperatively with other employees, supervisors, or managers.
- Serve customers courteously to represent the firm favorably.
- Treat others as individuals.
- Work cooperatively with other persons outside the firm such as suppliers, advertisers, community representatives, and others.
- Utilize appropriate assertiveness when working with other employees, managers, and customers.
- Understand the needs, desires, and goals of individuals with varying social and cultural backgrounds.
- Demonstrate initiative in dealing with customers, other employees, and managers.
- Demonstrate sensitivity to the needs of individuals.
- Demonstrate an understanding that success or failure depends not on technical proficiency alone, but on quality of interpersonal relations as well.
- Assume a shared responsibility for success or failure of the work group.
- Establish and maintain credibility with customers, co-workers, employees, and managers.
- Adjust to demands of job requirements such as deadlines, pressures, and conflicts.
- Reinforce positive behavior and provide constructive criticism.

Other OCD Publications

Perhaps you have studied or had helpful experience in developing the competencies listed. If you would like help in learning more in reviewing what you already know, you should use the following materials:

- *General Marketing Curriculum*
- *Advanced Marketing Curriculum*
- *Applied Arithmetic for Distribution*
- *General Merchandising*
- *Your Attitude Is Showing*
- *Practical Selling*
- *Basic Retail Credit*
- *Advertising*
- *Color Fundamentals of Marketing*
- *Merchandise Display*
- *Physical Distribution*
- *American Enterprise Series*

–Including,
  - *The Selling Function*
  - *Merchandising and Buying*
  - *The Promotion Function*

  - *The Marketing Function*
  - *The Management Function*
  - *Financial Management*
- *Visual Merchandising* (slide/tape presentation)

All of these publications are available from the Center for Occupational Curriculum Development, P. O. Box 7218, The University of Texas at Austin, Austin, Texas 78712.

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Fishing and the American Angler

***Objectives:** After completing this assignment, you will be able to—*

1. *list three reasons why a person may not be required to buy a fishing license;*
2. *discuss how increased leisure time for America's workers can affect recreational fishing;*
3. *cite at least three industries that are affected by recreational fishing;*
4. *name at least seven trends in recreational fishing that may affect the fishing tackle industry; and*
5. *briefly describe six types of recreational fishing.*

Fishing as Recreation

Fishing is one of America's most popular forms of recreation. Although over 31 million fishing licenses are sold in the United States each year, a fishing license is not required for every person who fishes. Children and senior citizens do not usually have to buy a license and some states do not require licenses for saltwater fishing. Other states do not require licenses of those fishing on their own property or in their own county. It is estimated that when the number of people who fish without a license are added to those who buy licenses, over 50 million people are found to fish for sport.

Fishing is not new. Early tribes quickly learned how to catch fish from nearby rivers and oceans, using nets, spears, traps, lodging bones, and other tools. Some tribes even used seabirds to catch fish. (A ring was placed around the bird's neck to prevent it from swallowing the fish it caught.)

Fishing was sometimes hard work, and the life of the fisher and the tribe depended upon his or her success. Even though hardship and need often existed in early tribal living, most fishers still enjoyed fishing. Even in early civilizations, fishing was often looked upon as a form of recreation as well as a way to put food on the table.

People today still depend on fishing as a way to provide food. This is usually a job for commercial fishers or anglers who catch and sell fish for a living. Some individuals who live near good fishing water still fish for the purpose of providing food for their families. Most of us, however, do not fish for a living or only for food provision. We fish for the fun of it, for recreation.

Fishing is highly popular because it can be enjoyed in many ways. Some enjoy the peace and quiet of fishing with a cane pole in a stream or lake. Others like to spend an entire day casting lures into a lake, stream, or ocean. Still others prefer to fish alone. Some are happy to catch a trout that is less than a foot long, and others may fish for blue marlin or mako sharks that may weigh over a thousand pounds. In all cases, fishing provides excitement and gives people an opportunity to "get back to nature." Finally, it may still result in the provision of food for the table.

Your future as a salesperson, manager, or owner of a fishing equipment store should be very good. Probably more people will be spending more time fishing in the coming years. The main reason for this increase in fishing is the increase in leisure time. Leisure time is time spent away from the job—time that can be spent in recreational activities.

As our nation's business and industry become more efficient, more products can be produced in less time. New machines and materials make it possible for a worker today to produce more goods and services in eight hours than was possible 10 or 20 years ago. Some businesses are giving workers more time off so they will not produce more goods and services than are needed. This time off may be in the form of more holidays, longer vacations, or even three-day weekends.

All forms of recreation will expand as leisure time increases. People who fish will use their extra leisure time to make more fishing trips. These trips may also increase in length, from one or two days to three or four days for each trip. As people spend more time fishing, they will need more rods, reels, line, and lures. And accordingly, the fishing tackle business should be very good in the years ahead.

Economic Impact of Fishing on Other Businesses

Since increased fishing results in the increased sale of fishing equipment, it is also interesting to see how this situation can affect other businesses. Manufacturers of plastic, stainless steel, and fiberglass all benefit from the production of millions of pieces of fishing equipment each year. Several other businesses and manufacturers also benefit from the great interest in recreational fishing. Let's look at just a few.

Battery Manufacturers

As recreational fishing has grown, so has the use of outboard, inboard, inboard-outboard, and trolling motors. Most motors above 10 horsepower have electric starting as a standard or optional feature. Have you ever considered the number of batteries that are sold each year for use with outboard motors? Trolling motors are becoming more popular, and anglers keep two batteries in the boat to ensure a full day of fishing while trolling.

Petroleum Industry

This industry has benefited from recreational fishing activities in at least two ways. One is through the increased sales of oil and gasoline used to power fishing boats, resulting from the trend toward larger and faster outboard and outboard-inboard motors. Oil and gas sales have increased to people who are willing to drive to a favorite fishing spot. Tournament fishing, drawing anglers from great distances, has also contributed to this trend.

Food and Lodging Industries

Recreational fishing also adds to the income of many restaurants, motels, and hotels. Anglers often prefer to buy their meals, so more time can be spent fishing. Many anglers are now more interested in convenience than in economy. This is a change from the time when people who fished were likely to camp out and cook all their meals. Anglers often will spend a hard day fishing and then welcome the soft beds, air-conditioning, and television provided by a motel. More overnight stays are occurring now because more people are willing to drive farther away from home to fish. In some parts of the nation, it is not unusual for anglers to drive up to 300 or 400 miles to fish at a favorite lake or stream.

Some families have "fishing vacations," spending a week or more at a favorite fishing location. They usually stay in a motel or lodge, and eat most meals in restaurants. This contributes to a sizable part of the gross income of restaurant and lodging businesses.

Several other types of businesses also benefit from recreational fishing. Tire dealers, grocery stores, beverage manufacturers, and boat and motor repair shops are just a few businesses that make more money because people have "gone fishing."

Recreational Fishing Trends

Several trends are occurring that can affect fishing tackle sales. One of these trends, not limited only to anglers, is that people want more conveniences and are willing to pay for them. And thus, more and more anglers are likely to buy more merchandise from your tackle shop.

Specialization in Fishing

Anglers today tend to specialize more in the species they fish for than in the past. Although many still go to a lake, stream, or ocean, hoping to catch almost any kind of fish, a larger number of anglers are primarily interested in fishing for only one or two species. Each part of the country has several available types of fish. In the southern states, many anglers specialize in fishing for the largemouth black bass. This has resulted in the formation of clubs and associations that have regular meetings. These meetings may include films on largemouth black bass fishing, the demonstration of equipment and techniques, and so on. Most of these clubs regularly participate in bass-fishing tournaments.

Healthy populations of black bass, crappie, catfish, white bass, and sometimes freshwater striped bass (saltwater striped bass acclimated to freshwater) exist in most southern lakes. On these lakes, you will usually find people who specialize in fishing for each species. Some will fish only for bass, some only for crappie, others for catfish, and so forth. Most will occasionally fish for each species but still spend most of their fishing time trying to catch one species.

Fishing for each species requires different techniques and various types of fishing tackle. Recognizing this, tackle manufacturers have developed lures, hooks, reels, rods, and other equipment for use in fishing for each species. An important point to remember is that a good tackle salesperson can sell more merchandise to "specialist" anglers than to "generalist" anglers. By learning your product line for each type of fishing, you can better satisfy each customer's need, whether it is to fish for bass, crappie, walleye, northern pike, rainbow trout, or tarpon. Knowing the fish, the customers, and the products you sell can greatly increase your sales. This is usually the first requirement for moving up in your company.

Tournament Fishing

Tournament fishing is becoming very popular in many areas. In some tournaments, anglers try to catch the largest fish in each of several species. These tournaments may last for a month or more. In other tournaments, anglers catch only one species of fish. These may be limited to one day and not usually more than three days. In states where black bass are found, many bass club members will fish in local tournaments every two or three weeks. In addition to local tournaments, regional, state, and national tournaments are held for professional anglers who depend upon tournament winnings as a part or all of their livelihood. Tournament fishing may be held for any species of saltwater or freshwater fish.

It is possible that you may sell quite a bit of merchandise to local tournament anglers. You will sell to many more anglers who read about tournaments. By keeping up with the tournament winners, sizes of winning fish, biggest strings of fish, and lures used by the winners, you should be able to boost your sales. If you can tell a customer that John Jones caught a winning fish on a Mepps Black Fury while fishing in 12-foot-deep water, you will probably impress your customer. If you then take a Mepps Black Fury from the lure display, point out its features, and give advice on how to fish with it, you are likely to make a sale.

Fishing Schools

Fishing schools are not attended by large numbers of "average" anglers, but more schools are being held. They usually get a great deal of publicity in local and regional newspaper sports pages. These schools may be sponsored by a fishing lodge, a fishing club or association, or perhaps by a tackle manufacturer. Big-name fishers are usually invited to give talks and demonstrations on casting, selection of equipment, and how to fish with certain lures. A registration fee is usually charged to participants.

The main value of these "schools" for you, the tackle salesperson, is that you can refer to them when selling to customers. Customers are usually impressed with a salesperson's knowledge of the "experts'" names, what they recommend, and the equipment they use in fishing schools, as well as in tournaments.

Catalogue Sales by Fishing Associations

Some fishing clubs and associations provide catalogue buying services to their members. Members of the association and other interested persons are sent catalogues and promotional brochures for limited or full lines of fishing equipment. The prices of merchandise offered through these organizations may be the same or somewhat less than the manufacturer's suggested retail price.

As a trainee in a fishing tackle merchandising career, you have two reasons for learning more about these operations. The first reason is to know who your competition is and how effectively it is competing with you. Many of the people on the mailing list of these catalogue sales operations are serious fishers who buy a great deal of tackle each year. If they all purchase through a catalogue, your business could suffer. Another reason you might wish to investigate catalogue sales operations is to broaden your knowledge of career opportunities. You may develop an interest in working in that type of merchandising operation.

Tackle Shops Franchised by Fishing Associations

A relatively new type of fishing tackle business is franchised by a national or regional fishing club or association. These tackle shops usually carry a full line of fishing equipment and may also sell boats and motors. They may participate in national advertising campaigns sponsored by the franchising corporation in the same way that hamburger, pizza, and hot dog franchises do with their parent organizations. You should investigate these franchise operations for the same reason you should learn more about catalogue sales operations. You need to know your competition, and you may wish to investigate the career potential of this type of business, especially if you hope to own your own tackle shop someday.

Package-Plan Fishing Trips

Many fishing lodges, especially in Canada, have sold package-plan fishing trips to anglers for several years. A package trip usually includes transportation (often by air), lodging, meals, boats, and guide service. It may also include filleting, freezing, and packaging the fish caught. These package trips are now being sold to anglers wishing to fish in Mexico, Central America, and South America, as well as Canada and the United States. As a tackle salesperson, you should be familiar with some of these package trips, if only as a topic of conversation with customers. You should especially be familiar with those your customers have taken or might be interested in taking.

If you write the people who sell these trips, you can possibly get information about the type of fishing that is done and an idea about the kind of tackle to suggest to people planning such trips.

Experimentation with Species of Fish

Various state game and fish departments are experimenting with new species of fish. Many states now recognize the value of a healthy recreational fishing program to the state's economy, and these states are experimenting in order to improve the variety and quality of recreational fishing. The transplanting of salmon and trout species has occurred in the northern states, and the southern states have experimented for several years with various strains of bass.

Experimentation usually takes one of three forms. One type transplants a native U.S. fish to a new location, where it did not exist before. This has been done with both saltwater and freshwater fish. Some saltwater species have been transplanted to freshwater lakes and streams with success. One of the most popular experiments has been to stock saltwater striped bass in fresh water. Coho salmon have also been successfully transplanted into the Great Lakes.

Another type of experiment transplants a foreign species of fish into lakes and streams of this country. Fish from Africa and South

America are being considered for transplanting into U.S. waters. Fish biologists must be certain that the new fish will not harm native species or habitats before transplants can occur.

A third type of experiment is to develop hybrid strains of game fish. An example is crossbreeding the Florida strain of black bass with regular black bass to produce a larger black bass.

As a fishing tackle salesperson, you need to know about the various kinds of experiments being conducted in your area. You also should find out what fishing techniques are best for the new fish that are or may be introduced into lakes or streams in your area.

These are only a few of the innovations or trends that you should be familiar with. Some will affect your sales efforts more than others. If you really plan to stay in the fishing tackle business, as a salesperson, a manager, or an owner, you must learn as much as possible about all phases of recreational fishing. Knowing specifically about what your customers need to know and being able to sell tackle that meets their needs is what your business is all about.

Types of Fishing

Recreational fishing can be divided into many different types or categories. One division is between saltwater fishing and freshwater fishing. Saltwater fishing can then be divided into surf fishing, deep-sea fishing, bay fishing, and tidal river fishing. Freshwater fishing can be separated into river fishing, lake fishing, stream fishing, and so forth. You might also divide fishing into geographic locations or according to the species of fish.

Another way to look at fishing is according to the type of equipment anglers use. Tackle salespeople need to know about many different types of fishing. Tackle shops seldom specialize to the point of stocking equipment used to catch only one species of fish (rainbow trout, for example). Seldom will you find tackle shops that stock only one type of fishing tackle, such as fly rod equipment. Since almost all tackle shops stock a general line of fishing equipment, the salesperson must know about several types of fishing techniques. Within a period of less than an hour, you may be asked to:

- recommend a rod to match a casting reel that was received as a retirement gift;
- suggest the proper line to go with a particular fly rod and reel;
- explain how to rig a trotline and suggest the proper hook sizes to use on a trotline;
- sell wire line for deep-water trolling; or
- suggest a proper line for plastic worm fishing.

The point is that the tackle salesperson should have general knowledge of all types of fishing as well as specific knowledge about the tackle most likely to be used in a particular area. The following is a brief explanation of several types of fishing, according to the equipment used. Most of these will be discussed in more detail in later assignments.

Cane Pole Fishing

Most people claim to have caught their first fish while fishing with a cane pole. This rig usually consists of a pole from 10 to 12 feet long, with a line slightly longer than the pole, a float (often called a *cork*), a piece of lead called a *sinker*, and a hook. This rig is used in almost all kinds of fishing waters—streams, lakes, ponds, and bays and oceans (usually from a pier). The rig is simple, easy to use and to replace. This is why it is such a favorite for people who are just starting to fish.

The pole may be constructed in many ways. The least expensive is the one-piece cane pole. Variations of the cane pole include jointed, fiberglass, and telescoping poles. Many experienced anglers use a pole with only a line and small lure (a spoon or jig), and no float. They jig the lure up and down in places where fish are suspected to be and are often very successful.

Trolling

Trolling is a technique that requires the use of a boat. The angler trolls (or pulls) a lure or bait through the water behind the boat, usually while traveling at a low speed. The angler uses a rod and reel for this type of fishing, usually a bait-casting rig. However, some use fly rods or spinning rods. This fishing technique is used in rivers, lakes, and oceans for many species of fish.

Almost all game fish that live in larger rivers, lakes, or oceans can be caught while trolling. Trolling may range from using a small boat or canoe to pull a small lure through a lake or river to using a 40-foot fishing yacht to troll a 2-pound bait fish across the surface of the ocean.

Trolling is popular for several reasons. First of all, it is an effective way to catch fish. It generally requires less skill than casting with a lure or fly. Finally, it is a good way to locate fish, so you can then anchor or drift and cast lures or flies.

Setline (Trotline) Fishing

Some argue that this is not recreational fishing, since too much emphasis is placed upon catching fish to eat. The same argument could sometimes be applied to anglers who use any type of fishing technique. The recreational value of setline fishing is often seen when families camp out or gather for a fishing get-together. Setlines are used while the people visit, play games, or tell stories.

Setlines are usually used for catfish, although many other species of fish are caught with them. A setline may be a line with one or two hooks and a sinker. These lines may be tied to the branch of a tree and dropped into a "hole" of water in the river where fish are likely to be. They may also be tied to almost any stationary object and pitched or thrown into the water. This is where the term *throw line* originated. These lines can be pulled in at any time to remove fish or to replace bait.

Another type of setline is the trotline, which is a single line of great strength, and of some length, that has several drop lines (sometimes called stagings). Each drop line has a hook tied to it. When fishing in a stream, one end of the line is tied to a stationary object on one bank, and the line is stretched across the stream and tied to a tree or rock on the other side. In lakes, the ends may be tied to the branches of trees that are standing in the lake. Fishing with a trotline usually requires the use of a boat. If a river or stream is shallow, some people will wade across the river to set the trotline and will also wade into the river to bait the hooks and remove fish that have been caught. This is not generally recommended since currents, unexpected holes, and slippery rocks can make it a dangerous activity.

Setline fishing is fairly uncomplicated but requires skill in placing and weighting the line. It is popular in most parts of the South, since it is an effective way to catch fish, especially very large catfish.

Bait Casting

The term *bait casting* is somewhat misleading. Bait-casting equipment consists of a casting reel, a rod, and line. This equipment is used to cast artificial lures (usually spoons, plugs, and jigs) that weigh from ¼ ounce to over 1 ounce. The bait-casting rig may also be used with a weight and hook to cast live or dead bait to a likely spot. A float may or may not be used. The angler who is using a bait may allow the bait to remain still or may reel it in gradually so more area is covered.

Bait-casting equipment is used in both fresh and salt water. Freshwater reels are usually of the level-wind type (a device that evenly winds the line onto the spool when reeling in). Although most smaller saltwater casting reels are also of the level-wind type, some are not. If a reel does not have a level-wind device, the thumb or finger is ordinarily used to ensure that the line goes onto the spool evenly.

Bait-casting rods may have one of several "actions" that enable them to handle a certain size of lure. Most are sturdier than spinning rods or fly rods.

A person using a bait-casting rod must have some degree of skill to cast accurately and to prevent the line on the reel from tangling into a "backlash." This is especially true when changing one weight of lure for another.

Bait-casting rigs are used to catch fish of all sizes but are designed for use where it is possible to catch a fish of good size.

Spin Fishing

Spinning is a technique by which small lures (usually ¼ ounce or less in weight) or bait are

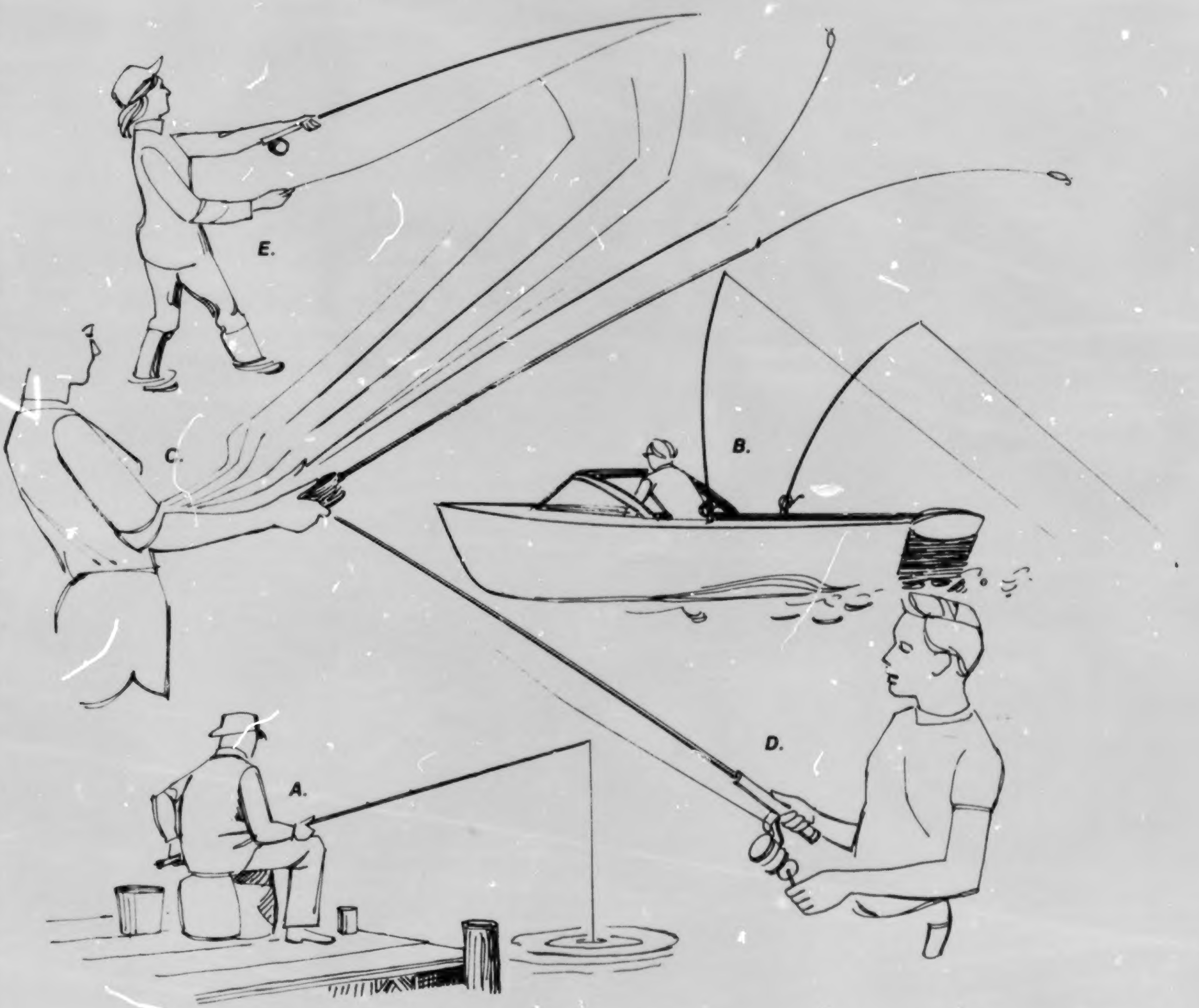

Fig. 1.1. A. Cane Pole Fishing B. Trolling C. Bait Casting D. Spin Fishing E. Fly Fishing

cast into locations where fish are suspected to be. Saltwater spinning rigs may be used to cast slightly larger lures.

Spinning equipment may range from ultralight freshwater rods and reels to spincasting reels that may be used on casting rods, saltwater spinning rods, and rods and reels that are even heavier. The rods are usually 6 feet long or longer and have limber actions. Reels may be open-face or closed-face. Open-face reels have no cover over the line. The line goes directly from the spool of the reel to the first guide on the rod. Closed-face reels have a cover over the line which extends from the spool through a hole in the cover and then through the first guide on the rod. Closed-face reels are more commonly called "spin-casting reels." Of these largest-selling reels on the national market, ZEBCO brand is the most popular.

Spinning equipment is used for fish of many sizes, even saltwater fish weighing over 20 pounds. This equipment's ability to handle small-diameter lines and to deliver very small lures makes it a favorite for small fish in very clear water.

Fly Fishing

Fly fishing is considered by some to be the most difficult type of fishing to learn. Fly casting is considered to be more difficult than some other types of casting, but it can be learned with practice. Fly fishing enables the angler to deliver the lightest possible lure to the fish. If the proper leader is used and the cast is skillfully performed, a fly can be placed above a fish very quietly and with almost no splash.

Fly rod equipment varies in weight, as is true of most other types of equipment. A person can find fly rod equipment that is suitable for fishing for small trout in a very narrow stream. Fly rods may also be found which cast large "bass bugs" (large flies that gurgle and pop as they are pulled across the water) or which may be used for saltwater fish, even tarpon. Fly rod equipment is not limited to delivering flies to fish. Some use fly rods for crappie fishing with minnows. Others use fly rods when bait fishing for carp that may weigh 15 or 20 pounds.

Fly rods are usually very light and have limber actions with either automatic or manual reels. Reels are used mainly for storing line and not for the purpose of reeling in a fish. The type of line used with a fly rod is very important. It is critical that the line and the rod be matched. In fly fishing, it is the weight of the line, not the fly, that enables the fly to be cast to a fish. The specific type of fishing determines the type of line used (see fig. 1.1).

Questions

1. How many fishing licenses are sold each year?
2. How many people are estimated to enjoy recreational fishing?
3. What is *leisure time*, and why is recreational fishing likely to increase?
4. The petroleum industry has benefited from increased recreational fishing. Name one trend that causes anglers to buy more oil and gasoline.
5. In the southern states, name the species that many anglers specialize in trying to catch.
6. Name two reasons why you should become familiar with catalogue sales organizations that sell fishing tackle.
7. What kind of information should you try to get from businesses that sell package fishing trips?
8. Package fishing trips give anglers opportunities to fish at many locations. Name four places outside the United States where anglers may fish on a package trip.
9. Name three types of experimentation that various game and fish departments are conducting that may improve recreational fishing.

10. Why is it important to know if your customer is a "generalist" or a "specialist" angler?

11. Why is it important to know what the "experts" recommend and the equipment they use in fishing schools and tournaments?

12. Name four categories into which recreational fishing can be divided.

13. Name the type of fishing equipment most people claim to have used in catching their first fish.

14. What size(s) of boats are used for trolling?

15. Describe the lure size that bait-casting equipment is designed to handle.

16. In fly fishing, what enables the fly to be cast to the fish?

Projects

1. Find a copy of your state's game and fish laws. List the exemptions that enable certain people to fish without a license.

2. Contact your local game warden or an office of your state's game and fish department. Ask for information about any experiments being conducted locally, or in your state, with transplanted or hybrid fish.

3. Contact a tire and battery store, and ask the manager approximately how many marine batteries and boat trailer tires are sold each year by that store.

4. Contact a local fishing club, and ask the president of the club to provide you with an estimate of the money spent annually on fishing equipment by the average member. Also ask if members order equipment from mail-order houses and, if so, about what dollar amount they spend each year.

2

Types of Game Fish

Objectives: *After completing this assignment, you will be able to—*

1. *name the specific characteristics of various freshwater and saltwater game fish;*
2. *list other names that various game fish are called;*
3. *identify the word* **structure** *as it relates to fishing;*
4. *describe the habitats preferred by various game fish; and*
5. *name the types of fishing gear used for various game fish.*

This assignment introduces the tackle salesperson to many of the game fish anglers hope to catch. Although it is impossible to mention every game fish, those included are fairly well distributed over much of the United States.

A fishing tackle salesperson should become very familiar with the fish found in the lakes or streams most often fished by his or her customers. Some customers may fish only in local waters, while others fish throughout the state. Others will visit other states and other countries.

As a salesperson, your knowledge should include the names of the various fish and how to identify them, their habits, and the fishing methods used to catch each species. This will enable you to talk with customers about many types of fish and to recommend equipment that will increase their chances of catching these fish. This assignment identifies each fish, provides a description, and discusses its habitat (where it lives) and the methods and equipment (tackle) used when angling for the fish.

Freshwater Species

Names are sometimes confusing when various fish are identified. Largemouth bass have been called green trout by some people, and often youngsters call a bluegill a perch. Crappie have several different names, depending on the part of the country they inhabit. The fish described in this assignment are identified by their proper names. The salesperson should be familiar with these and any local names given to the various fish.

Largemouth Bass

This fish is sometimes called green trout, Oswego bass, black bass, and green bass. It is similar to the smallmouth bass but can be distinguished by the fact that its mouth is larger, extending behind the eyes of the fish. Another distinguishing characteristic is that the dorsal fin of the largemouth bass is almost separated into two parts, while the dorsal fin of the smallmouth is one, continuous fin. The largemouth bass is usually black and greenish, with a dark horizontal band from head to tail.

The largemouth bass lives in a variety of waters, ranging from the Gulf Coast states northward to Minnesota. This fish likes water that provides a shallow feeding area with quick access to deep water for protection. It is a "structure" fish, preferring to stay around submerged trees, brush, boathouses, submerged sandbars, and other places that provide protection and a shelter from which to attack bait fish, frogs, crayfish, and most anything else that it can swallow.

Anglers use all types of tackle to fish for largemouth bass. Bait-casting rigs are most popular in water with trees or submerged brush. Many anglers use lighter equipment when there is less chance that the bass will wrap the line around a limb on the first run after being hooked. Live bait and all types of artificial lures are used in largemouth bass fishing. The plastic worm, eel, and spinner baits are favorites in addition to spoons, crank baits, bass bugs, and many others. (See Assignment 7 for a full discussion of the lures mentioned in this assignment and others.)

Smallmouth Bass

This important game fish is similar to the largemouth bass. Its mouth, however, does not extend behind the eyes and its dorsal fin appears as one, continuous fin. The smallmouth bass is bronze or brownish with vertical olive-colored bars along its body.

The smallmouth bass is found throughout much of the northern United States and ranges as far south as the Tennessee Valley Authority lakes in Tennessee and Kentucky. It is not usually found in the deep South where the water becomes very warm during the summer months. Some southern states, including Texas, are stocking the smallmouth bass. These fish prefer clear water and gravel or rocky bottoms. They are often found along gravel bars, along rocky points that jut into the water, and around most rocky islands.

Anglers use almost all types of equipment to fish for smallmouth bass. Bait-casting and spin-casting rigs are popular, and fly rods are probably used more often for smallmouth than for largemouth bass. Live bait, including crayfish, worms, minnows, and frogs, are used. Favorite artificial lures include deerhair fly bugs, wet flies, spoons, and most lures that are used for largemouth bass. This fish is considered by many to be, pound for pound, one of the best fighting fish an angler can catch.

Spotted Bass

This fish is also called the Kentucky bass. The spotted bass has characteristics of both the largemouth and smallmouth bass. It is olive green on the back with dark spots between the lateral line and the dorsal fin. The lateral line on this fish is not as distinctly continuous as that of the largemouth bass.

The spotted bass is found in much of the southern range of waters inhabited by the largemouth bass. This fish prefers cool water and gravel-bottomed streams and lakes. It is often found in shallow water where a stream flows over rocks or gravel.

Spotted bass eat insects, fish, crayfish, and worms. They will take most of the same lures used for smallmouth and largemouth bass. They are often caught on bait-casting, spin-casting, and fly rod rigs, while the angler is fishing for largemouth or smallmouth bass.

White Bass

This fish has several names, but is most popularly called a "sand bass." It is a silvery fish with several (about 10) dark, narrow lines running the length of the body. The tail is forked, and there are two separate dorsal fins. The white bass is found throughout the Mississippi Basin and has been transplanted into many other areas. White bass live in most Texas lakes.

White bass seem to be best suited to large lakes but are also found in rivers and streams. They prefer relatively clear water that has a gravelly bottom on which to spawn.

White bass are caught with almost every kind of tackle. Spinning tackle is a favorite for this fish, since they are often caught in open water where there is less chance of snagging a limb or submerged bush. In the early spring, white bass travel upriver from the lake to spawn. During this time, anglers wade or fish from the bank or from boats. During the summer months, white bass often travel across the open water of a lake, chasing bait fish.

Anglers often wait until the location of the fish is pinpointed by seagulls that dive into the water for pieces of bait fish left behind by the white bass. Favorite lures include jigs, spoons, spinner baits, and some crank baits. Other anglers prefer night fishing with lanterns, using minnows for bait. Large numbers of fish may be caught on any outing, since white bass tend to

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run in schools. After putting up a good fight, they can be filleted for a tasty meal.

Striped Bass

The striped bass is a saltwater fish that has been transplanted into several freshwater lakes in the South. This has added a whole new dimension to fishing in those lakes. Anglers have an opportunity to fish for a tasty, good fighting fish that may weigh well over 20 pounds.

The striped bass is slimmer than other bass and has a projecting lower jaw. Two separated dorsal fins are on its back. Seven to eight dark stripes are found on its side and are often interrupted or broken.

The habits of landlocked striped bass are much the same as those of the white bass. During the early spring, they are often found upriver from the main body of the lake, while spawning. During the other months, they tend to stay in deeper water and may be located in the middle of the lake. They feed on schools of bait fish and can sometimes be located by watching seagulls in the area.

Some fishers have learned how to locate striped bass that are suspended in deep water by using depth finders. Also, the new graph chart recorders are especially effective at locating suspended schools of these bass. The more expensive chart recorders are far superior to ordinary depth finders for this type of fishing. Spoons, jigs, or other lures are then fished at the same depth as the fish.

Other "stripers" are taken by trolling large, deep-running baits, using large popping plugs while topwater fishing, and casting with jigs, plugs, and spoons. A striped bass sometimes gives a crappie angler an unexpected thrill when it takes a minnow and makes a run. Fly rod equipment is also sometimes used for striped bass.

Hybrid Bass

The hybrid striped bass has proven to be popular wherever it is stocked. It is a result of a cross between a white bass and a striped bass.

Hybrid bass have characteristics of both parents. This fish has a deep body like the white bass and does not look as long or slim as a striped bass. Its stripes are much more distinct than those of the white bass, but they tend to be broken and not continuous. Like the striped bass, several stripes extend to the tail.

Another characteristic of the hybrid striped bass, inherited from the striped bass, is that two tooth patches appear on the back of the tongue. Only one tooth patch is found on the tongue of a white bass. Finally, the size of the fish can often distinguish it from a white bass. Hybrid striped bass often weigh 5 pounds or more, some weighing as much as 15 to 17 pounds. White bass seldom exceed 3 pounds. Size must not be the only factor considered, since striped bass may weigh up to 20 pounds or more.

Hybrid bass are often found just below dams and in warm-water channels in lakes where hydroelectric plants are located. They tend to travel in schools when feeding on bait fish and are similar to white bass in their feeding habits. They will strike artificial lures and minnows or shad used as live bait. They are sometimes caught on cut bait. Spinning and bait-casting equipment are most popular for this fish. Hybrid bass provide an extremely hard fight when hooked and are considered an excellent game fish.

Crappie

The crappie (pronounced crop-pee) is one of America's most popular fish. It is found throughout most of the eastern half and parts of the western portion of the United States. Two types of crappie exist, the white crappie and the black crappie. They are very similar in appearance, but the black crappie has a longer dorsal fin and the body is blotched with dark spots. Both usually have a silvery tint, but the black crappie is darker. The bars on the side of the black crappie are not clear, while those on the white crappie are obvious. Both have very tender mouths, and it is easy to pull a hook from a crappie.

Crappie are found in streams and lakes. It is thought that the black crappie prefers clean water to a greater degree than the white crappie. Crappie like to stay around "structure," meaning submerged trees, brush, boat docks, and so forth.

Almost all kinds of equipment are used for crappie. Minnows are the only bait used by most bait fishers. Fly rods, spinning rods, and casting rods are widely used. Since the crappie is not usually a big fish, the lighter equipment provides good sport. The most popular lures include small jigs and small spoons. Some small spinner baits and crank baits are also used.

Lures must be worked slowly, and depth is an important factor. Crappie tend to move in schools, and several may be caught at one time. Suspended at various depths, they usually will not move very far upward or downward to attack a lure.

Walleye

The walleye is the largest member of the perch family and is a favorite of many anglers. It has a round, long body with two dorsal fins. It has a forked tail and large eyes. The walleye is usually olive green or olive brown in color, and its tail has a white tip on the lower lobe. Looking at the tail is one way to distinguish the walleye from a *sauger,* a close relative. Sometimes called walleyed pike, these fish have teeth which the angler must avoid.

Walleye have traditionally been found in the upper half of the United States, but are being successfully transplanted in many southern and southwestern waters. These fish seem to prefer large, clear streams and lakes that provide cool water in some locations of the lake or stream. They prefer to spawn in gravel or rocky areas.

Walleye provide good sport and good eating for the angler. They attain a respectable size (up to 12 to 14 pounds or more), congregate in schools, and are usually found near the bottom. They like minnows and night crawlers and will also take artificial lures. Spinning and bait-casting rigs are used most often in walleye fishing. When stream fishing, some anglers put several worms on a hook and allow the current to carry the bait to the fish.

As with most fish, the angler must remember not to give any slack line when fighting a walleye. The walleye is already a favorite fish in the upper Midwest and is expected to gain in popularity as it becomes more common in the South.

Northern Pike

The northern pike is a popular game fish usually found in the Great Lakes region. Several states, as far south as Texas, have introduced the northern pike to warmer waters. Most people refer to this fish as the northern pike, although it is sometimes called a jackfish or common pike.

The northern pike is elongated with a large and relatively flat head. It has duckbill jaws and large, sharp teeth. It has a white belly, a bluish-green back, and green sides with light spots. Dark markings are found on the anal and dorsal fins. The northern pike grows to a large size, often exceeding 30 pounds. It is common to catch fish in the 10-to-20-pound range.

Northern pike prefer cooler waters and are often found near weedbeds. They will forage into very deep water when seeking bait fish. In rivers, northern pike sometimes congregate on the downstream side of falls, dams, or other barriers. These fish prefer clean water.

Many anglers troll for northern pike, others prefer to cast, and still others fish with bait fish. Northern pike can be caught on most types of artificial lures. Spoons, shallow-running lures, and large bait fish are often used. Some anglers use spinning equipment, while others recommend bait-casting equipment because of the size of the fish.

Anglers should use strong leaders. Some use wire leaders to prevent the pike's sharp teeth from cutting the line. The northern pike is an excellent sport fish that can usually be counted upon to provide a good fight.

Catfish

Several varieties of catfish exist, and these often differ in preferred habitat, food habits, and appearance. Different angling techniques are also used for different types of catfish.

Channel Catfish. The channel catfish is probably the most popular of the catfish family. It is found in all but a few western states and always provides for good angling action. The channel catfish has a forked tail that distinguishes it from all but the blue catfish. It has a small head and is silvery gray with a white belly. Several small black dots are usually found on the sides of the channel catfish, except in the case of large adults. They may weigh from 15 to 20 pounds, but usually average 2 to 3 pounds.

Channel catfish prefer to live in rivers and larger lakes but may be found in smaller waters. They are often found in deep holes of water, around log piles, and in the swift shoal water of most rivers.

Anglers may use cane poles, casting and spinning rigs, trotlines, and even fly rods when fishing for the channel catfish. This fish occasionally takes artificial lures (even wet flies) but is usually caught with minnows, crickets, shrimp, or prepared baits. The channel catfish puts up a strong fight and is good to eat.

Blue Catfish. The blue catfish is found in much of Texas and throughout a large part of the Mississippi watershed. It has a forked tail and is blue in color, with a white belly. Its anal fin has 30 or more soft rays, while the channel catfish has a maximum of 29 soft rays. These fish commonly reach a weight of 20 to 40 pounds.

The blue catfish is found in larger rivers and lakes and in the deep holes of water below dams and spillways. It may be found in fast- or slow-moving water.

Anglers often use trotlines when fishing for the blue catfish. Others fish with fairly heavy rods and reels in the swift water below dams. Some bait lines are tied to jugs thrown into the fast-moving current just below a dam. Then, the jug is followed by boat. The blue catfish is caught on a variety of live and dead baits and is considered a good table fish.

Flathead Catfish. The flathead catfish, often called the yellow catfish, is found throughout Texas and much of the southern and midwestern United States. This fish may weigh as much as 100 pounds, and fish of 20 to 25 pounds are common. It has a very broad, flat head, and its mouth seems as wide as its head. The color of this fish may vary, depending on the water it lives in. In muddy water, it tends to have a yellowish tone. In clear water, the adult is dark to olive brown in color with dark markings on the sides.

The flathead lives in large streams and lakes, but may be found in smaller streams. It prefers to spend most of the time in deep holes of water, tends to stay near the bottom, and is a bottom feeder. It may be found in underwater caves or near rocks found in a stream or river.

Most flathead catfish are caught on trotlines, but many are caught by anglers fishing with bait. Throw lines are also popular. Some anglers tie the line to the branch of a live tree found on the riverbank. The green limb may be bent without breaking and tends to wear down the fish. Contrary to most other catfish, flatheads feed almost exclusively on live prey, usually other fish. Most are caught on hooks baited with live bream or sunfish. This challenging fish provides good eating for the successful angler.

Bullhead Catfish. Three different bullhead catfish are found—the brown, yellow, and black bullhead. These fish may also be called polliwogs, mud pout, or horned pout, depending on the location. The brown bullhead ranges over the eastern third of the nation. The yellow bullhead is found over most of the eastern half of the nation and part of Texas. The black bullhead is found in Texas and upward through the entire Midwest and the Ohio Valley. Bullheads are usually smaller than other catfish, often weighing less than a pound. The black bullhead is black to greenish black on the back, gray or white on the belly, and has black chin barbels. If caught in muddy water, this fish may be more yellow than black.

The bullhead is found in streams and ponds of various sizes. It seems to favor silty water with soft, mud bottoms. This fish is able to survive in polluted water better than most game fish.

The bullhead provides a great deal of sport to young anglers. In some areas, large groups of people, including adults and children, will often have an outing with the purpose of catching large numbers of bullhead. These outings often occur during the spring of the year.

The bullhead feeds on a variety of live and dead food. Worms, crickets, grasshoppers, or minnows are good bait. Although all types of tackle are used, light tackle provides more sport. Almost all fishing is done with the bait lowered to the bottom of the pond or stream. Bullhead is considered to be a tasty fish when properly prepared.

Bluegill

Bluegills are also known as *bream* (pronounced brĩm), sunperch, and pumpkinseed, and some people mistakenly refer to them as just perch. These small fish reach a maximum length of about 12 inches. Body color ranges from yellow to blue in many variations. Bluegills are usually found in quiet water, preferably among weeds or other types of protective coverings. They often gather around boat docks. This fish is found in most states and is popular with young and old anglers alike. Bluegills are stocked in most waters, including farm ponds, streams, and lakes.

Anglers use light tackle when fishing for bluegills. Some use cane poles with small weights and hooks and use worms or crickets as bait. Others use spinning equipment, often placing a fly a foot or so below a plastic bubble. Small spoons can sometimes be used. Fly fishers use both wet and dry flies with good success. Small popping bugs are also very effective when fishing with a fly rod. Bluegills are usually small, but are tasty when fried.

Rainbow Trout

Several species of trout are found in the United States, but the rainbow trout is more widespread than others. This trout is found throughout the Great Lakes area, Appalachian Mountains, the far West, and in some of the midwestern states. Rainbow trout have been successfully stocked in parts of Texas.

The rainbow trout is most easily identified by the pink stripe that runs along its body. Where the trout lives and what it eats can cause other identifying characteristics to change. The body color may vary from silver to dark olive, and the fins may become bright red in color. Most of the fish caught are relatively small, but rainbow trout can weigh up to 50 pounds.

Rainbow trout are found in lakes and streams. In streams, they are likely to be found under logs, in pools below swift water, or at the lower end of a fast-water pool. In the South, these fish are often found in streams below deep-water lakes. The water released from these lakes is cold and keeps the stream temperature cold enough for the rainbow.

All kinds of fishing equipment are used for rainbows. Spinning and fly equipment are most favored for stream and lake fishing. Some anglers use bait-casting equipment when fishing for rainbow trout living in lakes, since these fish may grow to a large size. Salmon eggs and worms are favorite baits, highly effective in catching these fish. These baits are often cast into the current and allowed to tumble along the bottom where the fish is located. Small spinner lures, small spoons, and flies are effective artificial lures.

Carp

The carp is considered by most anglers to be a trash fish. However, the carp provides a great deal of sport to young anglers and to others who fish for large carp for sport. Anglers sometimes hook a carp by mistake and think they have a good bass or other game fish, until the carp is pulled to the surface.

A carp has a humped body, large scales, and a small mouth. The upper jaw has two barbels on each side. Its color varies according to the water it inhabits, and may range from brassy green to a golden color.

The carp was introduced to the United States in the late 1800s. Originally, carp lived in Asia but eventually spread throughout most of Europe. In some countries, carp was considered to be a royal fish. These fish weigh up to 50 pounds.

Carp are found throughout most of the United States. They inhabit most kinds of water, but prefer warmer water. They are bottom feeders and often muddy the water as they feed. Carp often uproot vegetation in the water, and some anglers say that this disrupts the spawning habits of game fish.

Carp are often caught with doughballs, cheese, worms, bread, and prepared baits. Some anglers bait hooks with whole kernel corn or with grain. An angler may fish with a tight line and no bobber or with a small bobber.

Quill bobbers are often used, since they indicate when a carp is delicately mouthing the bait.

Anglers use bait-casting, spinning, and fly rod equipment when fishing for carp. Some anglers fish with very heavy tackle for large fish. Others use fly rods to drift doughballs into places where they suspect carp to be. This can provide excellent sport.

Saltwater Species

Saltwater game fish are so numerous that it is impossible to discuss each one. To further complicate things, different angling methods are used in various parts of the country for the same species of fish. This section describes a few of the more popular fish found in the Gulf of Mexico and along the Atlantic Coast.

Discussion is limited mainly to fish found in the surf and the bays. No attempt is made to describe the billfish (sailfish and blue and white marlin) or sharks which are becoming more popular with many anglers. Since this section includes only a few of the basic game fish, those who sell tackle to saltwater anglers need to do additional research about other local saltwater fish.

Flounder

The flounder is a popular fish that provides for some sport and is good to eat. Three main flounder species are found in the United States coastal waters. The southern flounder ranges from North Carolina to Texas. The summer flounder is found from the Gulf of St. Lawrence to the Chesapeake Bay. Southern flounder have white undersides and are olive on top. They may grow to 20 inches in length, with some larger fish reported. The summer flounder is usually gray, brown, or olive with some variations in color tints. Most are in the 2- to 5-pound range, but fish of up to 30 pounds have been reported. Winter flounder are usually a reddish-brown color.

Flounder are flat fish with oval-shaped bodies. Both eyes are found on one side of the head and they have practically continuous fins from head to tail. These fish burrow into sand or muddy bottoms and surprise worms, crabs, or shrimp that come along. They are often found in bays, especially near channels that provide protection from changes in temperature or water level. During high tide, they can be found in flats where the water may be little more than a foot deep. They are also caught in the surf, but most are found in protected areas.

Many flounder are gigged by anglers wading the shallows with lanterns. They locate the flounder by finding oval shapes in the sand, indicating that a flounder has burrowed into the sand or mud bottom. Then, the fish is gigged (speared). This is very productive, if indeed it is a flounder, not a stingray, that has burrowed into the sand.

Others use conventional fishing gear for flounder. Most recommend lighter spinning or bait-casting tackle for best results. The lighter tackle helps the angler feel when the fish nibbles lightly at the bait.

Hooks should be rather small. Some anglers use double-hook rigs. A fairly heavy sinker must be used if a strong current sweeps the bait off the bottom, where the flounder is found. Small pieces of clam, other cut bait, shrimp, blood worms, and sea worms are used as bait.

The area along channels, especially bends in the channel, and inlets are good places to fish. The flounder makes short runs when hooked, but is not usually a strong fighter. Those hooked when a current is running will sometimes use their flat shape to cause good resistance and will be hard to reel in. This is an excellent table fish that can be prepared in a variety of ways, according to taste.

Spotted Sea Trout

The spotted sea trout is most commonly known as a *speckled trout*, especially in Gulf Coast waters. Speckled trout are very popular, wherever they are found. Anglers consider it a good sport fish and very good to eat.

Speckled trout weigh an average of about 4 pounds as adults, but may grow as large as 12 to 15 pounds. Fish weighing from 6 to 9 pounds are common. This fish often has a bluish tint, is dark gray on the back, and has a silvery belly. The upper parts of its sides have black spots, also found on the dorsal and caudal fins. The body is long, with a long head and an underslung jaw. The fish has a number of relatively large, sharp teeth that discourage anglers from putting their fingers in the mouth.

Speckled trout are found along most of the Atlantic Coast and throughout the Gulf of Mexico. They are found in the surf as well as in bays, lagoons, and ship channels. Anglers from Gulf Coast states often fish near oil rig platforms erected in bays. These fish tend to move into deeper water during the winter and suffer if caught in shallow water when cold fronts sweep in from the north.

Anglers traditionally have used live shrimp when fishing for speckled trout. They often use a popping cork that attracts the fish's attention, hoping the fish will then see the bait. Many now use artificial lures, with spoons and jigs leading the list of lures. Jigs with plastic grubs or worms are very popular, along with some plugs.

Speckled trout often are found where water depth changes from shallow bay water to channel water. The angler can usually tell where this is because of the change in water color. Many wade within casting distance of the channel. Since speckled trout are usually found in schools, it is possible to catch several after one trout is finally hooked.

Gulf Coast anglers often start fishing very early in the morning in order to avoid the winds that pick up soon after sunrise. Speckled trout are caught on tackle ranging from fly rod to bait-casting equipment. Spinning rigs are popular, as are free-spool bait-casting reels. The speckled trout is an excellent sport fish that is also considered to be an outstanding table fish.

Red Drum

This fish is known as a "redfish" along the Gulf Coast. Along the Eastern Coast, the red drum is sometimes called a "channel bass." This is a popular fish and in some areas is considered to be as popular as the speckled trout.

Redfish are usually of a copper or bronze color. One of their most distinguishing marks is a black spot found on the base of the tail. These fish may be as large as 40 to 50 pounds, but most are smaller. In some localities, 6- to 8-pound fish are called "rat reds," while the larger fish are called "bull reds." Fish in the 2- to 6-pound range are most common, but larger fish are often caught.

Redfish are found in the bays and in the surf along the Gulf Coast. In the Carolinas, most anglers fish in the surf for redfish. These fish are affected by cold weather and other factors, such as too much salt in the water due to lack of rainfall in the watershed of rivers that run into the bays. Pollution is also a problem in some areas. Redfish often will be found in "holes" in a bay where the bottom is deeper than in surrounding waters.

Redfish are popular game fish wherever they are found. They are fond of shrimp, cut bait, clams, and crabs. They will also take artificial lures such as flies, jigs, spoons, some spinner baits, and short plastic worms or grubs. All types of tackle are used for redfish, and anglers may wade in the surf, fish from piers or jetties, fish from boats, or wade in the shallows of the bays. These are good table fish, especially those weighing 12 to 15 pounds. Larger fish tend to have coarse flesh, but are still eaten by many anglers.

Tarpon

A favorite sport fish for some anglers is the tarpon. This fish is primarily a sport fish and is not considered edible. Most are returned to the water after they are landed. One reason for its popularity is that it is found close to shore, sometimes in bays and inlets, it grows to a large size, and it provides an excellent fight when hooked.

Tarpon are covered with large scales that may be the size of silver dollars. The fish is silver with dark fins and an underslung lower jaw. The last ray of the dorsal fin is very long and points back toward the tail.

Tarpon are caught by anglers fishing from piers, bridges, boats, and also by surf fishers. Most anglers use rather heavy saltwater bait-casting and spinning rigs, but others use fly rods and still land some fish. This fish will strike artificial lures as well as take shrimp and other live bait. Many tarpon in the 100-pound range are caught each year, but most weigh from 15 to 40 pounds. Pound for pound, tarpon is a real game fish. Even smaller tarpon can give the angler a thrill of a lifetime with spectacular runs and acrobatic jumps.

Bluefish

A popular game fish along the Atlantic Coast is the bluefish. Small bluefish, up to 9 inches, are called snapper bluefish. Bluefish are excellent game fish and are good to eat.

Bluefish have a somewhat pointed snout and an underslung lower jaw. The mouth is large and filled with powerful teeth, and the tail is forked. This fish is bluish green on the top and silvery white on the belly.

Bluefish are found mainly along the Atlantic Coast and are generally found in deep water. Sometimes during the year, however, bluefish are found in the surf and in the bays along the coast. They tend to travel in packs or schools and are vicious when engaged in a feeding spree on bait fish.

Offshore anglers usually troll for bluefish, using a wire leader to prevent sharp teeth from cutting the line. Bait fish or various artificial lures are used when trolling. One thing the angler must remember is to troll along the edges of a school of bluefish, never through the middle of the school. To troll through the school will likely cause the fish to sound (swim to the bottom). Anglers may also catch bluefish from piers, from jetties, and in the surf.

Anglers use many methods, including bait fishing and bait casting and spin casting with lures. The lure should be kept moving, and live bait will usually get more results than dead bait. Since bluefish are so hard on lures, many anglers prefer to use various types of metal lures. Wooden or plastic lures are often ruined by the first bluefish caught, since the fish chews on the lure while it fights.

Striped Bass

The striped bass was included in the discussion of freshwater game fish, since it is now widely stocked in freshwater lakes and streams.

Sheepshead

The sheepshead is considered a good sport fish by many who fish in the Gulf of Mexico. This fish ranges as far north as Massachusetts on the Atlantic Coast, but is found mainly in the Gulf of Mexico. It is a colorful fish, with broad bands of yellow and black from head to tail. Its mouth is small but very hard, designed for crushing the shells of crustaceans and mollusks. Most sheepshead weigh from 1 to 2 pounds, but some are as large as 25 pounds.

Most anglers look for the sheepshead along piers and jetties where the fish feeds on crustaceans. Bait-casting rods are often used, since the fish may try to snub the line around a rock or piling. For the same reason, it is also a good idea to use a leader that can take some abuse. Shrimp, cut bait, and crabs may be used as bait. The angler must stay alert, since sheepshead are expert at stealing bait. For that reason, the angler usually fishes with a tight line which quickly signals when a fish is mouthing the bait.

Gaff-topsail Catfish

This fish is found along the Gulf Coast and is considered a good table fish by many anglers. Others consider all ocean catfish to be trash fish because of the things they eat.

The gaff-topsail catfish, often called a "gaff-top," differs in appearance from the common "hardhead" ocean catfish. The gaff-topsail catfish has a very long ray or spine at the front of its dorsal fin that ends in a slim filament. The pectoral fins also end in long filaments. This catfish must also be handled with care. The poison on its spines can cause severe pain and swelling if an angler is not cautious and is finned by the fish.

Gaff-topsail catfish are found in bays and in the ocean. They are most often found in channels that run through bays and are most easily caught in running currents. Anglers use dead shrimp and cut bait when fishing for gaff-topsail catfish. They often run in the 3- and 4-pound range and may be larger. Once one gaff-topsail catfish is located, an angler can usually catch a large number of them. They are usually filleted, and their white meat is very good when fried.

Questions

1. How is a largemouth bass different from a smallmouth bass?
2. What is *structure* in a lake?
3. What kinds of water do smallmouth bass prefer?
4. What is another name for the white bass?
5. It is possible for a person to catch a white bass, striped bass, and a hybrid bass in the same lake. Since these fish are similar in appearance, how does the angler distinguish one from the other?
6. What is the one bait used by almost all who bait fish for crappie?
7. How does one distinguish between a *walleye* and a *sauger?*
8. When fishing in a lake, where is a good place to fish for northern pike?
9. Name the most popular member of the catfish family.
10. Which catfish feeds almost exclusively upon live fish?
11. What are other names for the *bluegill?*
12. What is the easiest way to identify a rainbow trout?
13. Name the fish that burrows into the sand and is caught by gigging and by rod and reel.
14. Why do some anglers use popping corks when fishing for spotted sea trout?
15. What is the difference between a *rat redfish* and a *bull redfish?*
16. Name an outstanding saltwater sport fish that is considered inedible.
17. Why do many anglers prefer to use metal lures when fishing for bluefish?
18. Why must gaff-topsail catfish (as is true of all catfish) be handled with caution?

Projects

1. Make a list of all game fish found in your region. Contact your state's game and fish department for detailed information about each species. You may also need to use encyclopedias and articles from sports magazines in gathering this information. After gathering as much as possible, organize the information and place it in a notebook.
2. Select three game fish found in your region. Then, interview two people that you consider to be good anglers, asking them how they fish for each of the three game fish.

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Your Role as a Fishing Tackle Salesperson

Objectives: *After completing this assignment, you will be able to—*

1. *describe how sales records and inventory records assist in ordering merchandise;*
2. *cite the importance of the receiving and checking function and list the procedures to follow when damaged merchandise is delivered to the store;*
3. *explain how pricing of merchandise is an important function and how increased knowledge carries with it increased responsibility;*
4. *describe how a good display can help increase sales to customers;*
5. *state the importance of accuracy in performing the cashiering role;*
6. *explain what the term* ***inventory*** *means and the importance of maintaining an accurate inventory;*
7. *describe the procedure to follow when receiving merchandise for repair purposes;*
8. *tell how the employee contributes to store security;*
9. *recognize a person who buys fishing tackle for the purpose of enhancing prestige, and know why to "trade up" this type of customer;*
10. *identify the customer who is looking for utility in fishing tackle and tell how to sell to this type of customer;*
11. *explain how to sell to an* ***innovative customer;***
12. *list the steps you should follow when a customer asks for out-of-stock merchandise; and*
13. *identify the jobs considered to be* ***housekeeping*** *duties.*

A person working in a tackle shop is expected to do several jobs. Selling fishing tackle is usually considered the most important of these, but several other things must happen to ensure that sales are made. These include ordering merchandise, checking it in, pricing it, putting it on display, and several other sales-supporting activities. This assignment includes a discussion of some of these jobs.

Ordering Merchandise

This is an important job that is usually performed by the manager, assistant manager, or an experienced employee. New employees are often asked to assist in ordering by keeping notes about what customers ask for that are not stocked by the store or which are temporarily out of stock.

The person who places orders must know what merchandise has sold well in the past, and then make a good guess about what will sell in the future. Sales records and inventory records are important. Sales records may show that jointed cane fishing poles sell well during the late spring or early summer as younger children are introduced to fishing. They may also indicate that particular items, like jigs and plastic lizard baits, sell well during the winter and early spring.

Inventory records show how many units of each type of merchandise are in stock. Past sales records may show that the store will sell an average of 20 Brand X trolling motors during the month of June. If the inventory record shows that 10 Brand X trolling motors are in stock, the person placing orders will probably order 10 more trolling motors.

Sales and inventory records do not provide all the answers about what to order. Salespeople representing various tackle manufacturers will often stop by the store and try to sell new products not stocked by the store in the past. When this happens, the buyer for the store must sometimes guess about which products will really work and will be accepted by the store's customers.

It is not difficult to see the importance of good ordering. If the right merchandise is ordered, customers buy it and the store makes a profit. If the right quantities are not ordered, the store will not be as successful as it should be.

Receiving and Checking Merchandise

This may seem like an unexciting job, but it is one of the most important in the store. Some larger stores have people who are assigned only to the area where merchandise is unloaded from trucks and checked into the store's storeroom. In most tackle shops, all employees occasionally are responsible for checking in merchandise. Failure to accurately check delivered merchandise may cost the store a great deal of money.

Once the merchandise is unloaded, it must be counted. If the merchandise is in factory-sealed cartons or boxes, most stores assume that the count inside the carton is accurate. (If a carton of lures is supposed to contain 24 lures, most will assume the factory really did put in 24 lures.)

Some stores have the policy of opening even sealed cartons to see that they contain the correct merchandise. When checking in odd lots of merchandise (less than a full carton), most stores require employees to count each item. (If 10 floating flashlights were ordered from a jobber, the employee is expected to count the flashlights to see that 10 were received.)

Another part of this job is to see that the right merchandise was received and that it is in good condition. (Twenty Model 2 reels from Brand X are not the same as 20 Model S reels from Brand X.) Always check to see that the merchandise is undamaged. Be especially alert for cartons that appear to have been crushed or that may have gotten wet.

If a broken rod is delivered, it is better to handle it now, before your store takes possession and assumes responsibility for it. The delivery truck driver will give you a waybill or invoice on which all items are listed. If something is damaged, follow the store's policy on how to handle it.

This usually means making a notation on the invoice about the damage and having the truck driver sign his or her name beside the notation, acknowledging that the item was damaged when you received it. An alert employee can save the store a great deal of trouble and money by doing a good job of receiving and checking merchandise.

Pricing Merchandise

Deciding what the store's merchandise will sell for is usually the manager's job. In some chain store operations, prices are set at the home office, and each store is sent a list of prices for merchandise stocked in the various stores. At first, the employee will probably just be responsible for placing price tags on the merchandise. Eventually, all career-minded employees should learn how prices are determined. This knowledge also carries with it the responsibility to keep pricing information confidential.

Pricing must be accurate. If a price sticker for $2.49 is supposed to be placed on a small pair of fishing pliers, do not put it on the larger fishing pliers that sell for $4.49. Mistakes like this can cause the store to lose money.

Pricing is very important during sales. All employees should know what merchandise is on sale and the sale prices. They should double-check to see that the right merchandise is marked down. Most stores honor the price placed on merchandise. If the sale tag is placed on the wrong item, a profit loss can occur.

Displaying Merchandise

Most customers look at fishing tackle before they buy it, and it's important that it is displayed in an effective way. The tackle shop employee should quickly learn the value of a good display and useful techniques for building a display.

Many fishing tackle sales are the result of impulse buying. If Mr. Brown walks into the store to "just look around" and buys a new lure or a new stringer without really having planned to make the purchases, he has bought impulsively. Good displays present fishing tackle in an attractive or interesting way so that customers often buy impulsively. They also may remind the customer of a needed item or of a magazine ad that created an interest in the product.

A good imagination helps in creating interesting displays. Displays may range from posters or pictures to a lure being pulled through a tank of water to demonstrate its action.

Displays should also be used to remind customers about advertised merchandise. These displays should be placed in high traffic locations and are often placed at the end of a counter.

Expensive merchandise, such as reels, binoculars, and depth finders, are usually placed in protected display shelves that only store employees may open. These displays must also be kept neat, clean, and attractive for best results.

Some questions to consider when preparing displays are:

- Where should displays be built? (Where is the heaviest customer traffic?)
- When should displays be built? (Before or after store hours or while customers are in the store?)
- What aids are provided by manufacturers? (Props, pictures, and posters)
- Which merchandise is to be displayed and why?
- How high should displays be? (Will they keep employees from seeing shoplifters?)
- Where do the signs come from? (Must employees make signs and, if so, how?)

Housekeeping

How do you feel about a store that has dirty floors cluttered with boxes, dusty shelves, and dusty, disorderly merchandise, and two burned-out light bulbs? The word *housekeeping* refers to jobs that are often considered to be dull work, such as sweeping, dusting, and straightening. No matter how dull it is, housekeeping is very important to the success of the store.

Housekeeping in a sporting goods store includes keeping floors clean by sweeping, mopping, or vacuuming, keeping boxes out of sight (unless used as part of a display), keeping stock straight, dusting merchandise regularly, keeping all fixtures in good order, and reporting problems to the manager (a cracked display case, doors that do not close easily, and so forth.)

This type of maintenance is needed continuously. Anytime the employee is not waiting on a customer and no other duty has been assigned, he or she should automatically begin looking for housekeeping opportunities. Attention to housekeeping often calls attention to the good employee and paves the way for advancement.

Cashiering

Most salespeople are also expected to operate the cash register. Some stores have one person assigned to the cashier's position, but most expect salespeople to ring up their own sales. Cashiering is an important part of the tackle salesperson's job. Mistakes here will usually cause the store to lose money or cause customers to lose goodwill for the store.

A career-minded employee should try to learn as many jobs as possible. Learning to ring up sales by indicating the correct employee number and department number is important. Counting back change and knowing how to handle shortchange artists is another important skill. The employee should learn how to ring out the register at the end of the day. Other kinds of duties that cashiers may do include—

- giving directions to departments and merchandise;
- knowing about all sale merchandise;
- knowing store policy on discounts to customers;
- keeping a record of merchandise requested but which is not in stock;
- overseeing price changes on merchandise;

- handling merchandise exchanges and refunds;
- securing change for the register; and
- using the public address sytem to announce timed specials in department or discount stores.

Checking the Ads

Each employee is expected to know what the store is advertising each week and the correct price for each advertised item. It also helps the employee to remember to tell customers about sale items, possibly increasing sales. The tackle salesperson should also ask the manager if substitute items are allowed if the sale merchandise is sold out.

Helping with Inventory

Inventory includes the entire stock that a store has on hand to sell to customers. If a tackle store sold nothing but plastic worms and it had 10,000 plastic worms to sell, its inventory would be 10,000 plastic worms. Stores handle inventory in different ways. Some keep an updated inventory, so they know how much stock they have on hand each day. Some cash registers help the store manager keep up with inventory by providing printouts on the number of each item sold during the day. In some tackle shops, employees must keep detailed records of what is sold daily. This is done by using sales books, sales slips, and tags from all merchandise sold.

Some stores inventory periodically during the year. These may be semiannually, quarterly, or more often, if needed. These inventories are taken by counting every piece of merchandise on the sales floor or in the stockroom. When periodic inventories are taken, usually two employees work as a team. One counts the merchandise, while the other records the units on hand. Most items are counted as individual units (25 Devil's Horse lures, for example).

Some items, like sinkers or swivels that are kept in bulk, may be counted and weighed until 1 pound is reached. When all the sinkers are weighed, for example, that weight in pounds is multiplied by the number of sinkers it took to weigh a pound. This gives the total (approximate) number of sinkers.

Keeping an accurate inventory is very important. If the dollar amount of the inventory is less than it should be, the manager knows that something is wrong. If no mistakes are found in the counting of the merchandise, then shrinkage (theft) is usually assumed to have occurred.

Making Repairs and Adjustments

Some tackle shops provide repair services for customers. This is often limited to reels but may include other equipment. Usually, only one or two skilled employees will be assigned to do repair work. Some stores send the equipment to another repair service.

For most employees, handling repair orders will mainly involve taking the merchandise from the customer and tagging it with information about the customer's name, address, phone number, and an indication of the problem the customer had with the merchandise. The employee should attempt to learn enough about fishing equipment so that minor adjustments and repairs can be done for the customer. This increases the customers' confidence in the tackle salesperson.

It is possible that the employee will be asked to handle merchandise that is under warranty. When this occurs, it is important to know about the warranties provided by the various companies. Some stores provide customer guarantees in addition to manufacturer's warranties.

The employee must know the procedure to follow for the various lines of merchandise carried by the store. When handling warranty requests, be sure to pay attention to rates on receipts provided by the customer and enter the correct date on any required forms.

Protecting the Store

The word *security* refers to the store's efforts not

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to lose merchandise to shoplifters, employees, burglars, or robbers. Almost every store has security problems. Tackle shops may have more problems than some other stores, since so much of the merchandise is small and easily concealed.

Employees must learn store policies concerning security. These policies may include rules about waiting on family members, handling sales to other employees, bringing packages into the store, knowing where to keep personal belongings, knowing where to enter and exit in the store, and so forth. The employee should also learn how to handle a shoplifter and how to use security devices, such as observation cameras, mirrors, and tags that trip alarms when carried out of the store.

Store policies will vary, but most employers agree on the following:

- The best way to prevent shoplifting is to let each customer know that you are aware they are in the store and that you are nearby if needed.
- If a robbery takes place, employees should not resist the robber. It is easier to replace lost money than a lost life.
- Delivery people should not be allowed in the store's storeroom. Store employees should check merchandise in and put it in the storeroom.

These are just a few of the more important duties that a fishing tackle salesperson is expected to perform. Selling has been referred to several times but has not been discussed as a separate category. *Selling* requires specialized knowledge and skills, such as developing product knowledge, knowing how to approach customers, learning customer needs and wants, demonstrating merchandise, answering customer questions about merchandise, and knowing how to ask the customer to buy merchandise.

Most of the selling skills will be learned in the regular marketing and distributive education classes. Everything you learn about selling must be used to sell the merchandise carried by your store. Since this manual deals with fishing tackle shops, the next part of this assignment includes a good look at why people buy fishing tackle and how you should sell to them.

Recognizing Customers' Needs

An important part of the job of selling fishing tackle is to know quickly what a customer needs. Master salespeople say that customers have many psychological needs that must be met as well as their obvious physical needs. To complicate matters, two people buying identical items may have different needs or reasons for buying the merchandise. One customer may want to buy a particular brand of fishing reel because it is supposed to be the best on the market. Another customer may want to buy the same reel because it looks appealing. Still another may buy it because his wife wanted one for her birthday.

Buying motives may also differ from one type of tackle to another. A customer may demand only the best in a trolling motor but is willing to try out a new and unproven lure just because it is something different. This section discusses some of the motives people have when buying fishing tackle.

A Desire for Prestige

Some people are proud of the fact that they buy only the very best or the most highly valued fishing equipment. Persons in this category will usually buy the highest-priced and best brand of fishing reel, even though it is proven that a less-expensive reel is just as good in construction and performance. These people use their fishing equipment as a status symbol to convince others of their good taste and ability to pay.

A person may have a perfectly good free-spool, star drag, steel ball bearing casting reel, but will buy a new model if it is "improved" or is advertised as a presentation model. These people usually buy only merchandise with the better brand names. This may include everything from the rod and reel down to the fillet knife stored in the tackle box.

The tackle salesperson should not hesitate to "trade up" to this person when conducting a sales presentation. This individual receives great satisfaction from "buying the best" and usually responds favorably to attempts to sell the better lines of merchandise. Be sure to mention professional anglers and other well-known personalities who use that particular item.

Another point to remember is that it is not only the very wealthy who buy prestige products. (In fact, many wealthy people look for the best bargain, not the most popular or most expensive equipment.) Some people are willing to save until they have enough money to buy the best. For these people, the purchase of a high-priced prestige item is a significant purchase.

A Desire for Dependability

Most customers want to buy merchandise that has good utility. This means that the purchased fishing equipment will perform the job required of it. A reel, for example, should hold adequate line, cast and retrieve smoothly, stand up to hard usage, and require a minimum of upkeep. If a reel that costs $25.00 will perform as well as a reel that costs $50.00, these customers will usually buy the $25.00 reel. If they need a fluorescent line, they will buy it. If not, they are just as happy with any line that does the job expected of it. Most customers are not superconscious about brands, although some tend to stay with brands they have found to be worthy of their confidence.

When serving most customers, the tackle salesperson needs to emphasize the quality and dependability of the merchandise. When selling a graphite rod, the salesperson should emphasize its ability to enable the angler to feel soft strikes that could never be felt with a fiberglass rod.

Sell the real advantages of the rod. Don't justify the customer's buying it just because Mr. Jones, the town's most famous fisherman, bought one. Customers appreciate honesty and good advice. If the differences in two reels lie mainly in their appearance, the customer appreciates that information. If the metal or plastic in the more expensive tackle box is twice as thick as that in the less expensive box, the customer wants to know.

The job of the tackle salesperson is to provide as much product information as the customer needs or asks for. The customer then decides on the item that he or she considers to be the best buy. Good product knowledge is critical in all sales, and most customers expect that a good salesperson will demonstrate this knowledge.

A Desire for Something New and Different

Some people are called "innovative customers" because they are willing to try out new products. These customers may be happy with the tackle they own but still are interested in new merchandise. People in this category are good prospects for new lures, reels with new features, and rods built of new materials.

The tackle salesperson should try to learn which regular customers may be classified as innovative customers. When these people visit the tackle shop, they should be shown new products. This may be done in a "soft sell" way, depending on the customer.

The salesperson should also learn to spot innovative customers who may never have been in the store before. This may be possible by listening to comments and noting the customers' interest in a new item. Good product information is still important, but, generally, innovative customers have a mindset or disposition that makes it easier to sell them new products.

A Desire to Buy What Worked for the Other Angler

Nothing is as frustrating as fishing side by side with another angler and watching that person catch fish while you catch nothing. Close observation may indicate that the other angler's success is because of a particular technique used. It may be that some piece of equipment is contributing to the other person's success.

Many anglers have had the experience of seeing a fellow angler catch all the fish with a particular lure. When this happens, these people will usually buy a lure just like it at the earliest opportunity. An angler who borrows a friend's rod and reel may be so impressed with the reel that he or she decides to buy one just like it. A great number of sales each year are made to people who want to buy items that they have seen other anglers use successfully.

Usually in this kind of sale, the tackle salesperson needs only to have the desired merchandise to sell it, and no great amount of product information must be provided. Problems can arise if the merchandise is not in stock. The customer may be determined to buy only a certain color in a topwater lure, for example. Or the customer may want only a certain model of a particular brand of reel. If the item is not in stock, an attempt should be made to get the merchandise from another store in town, if possible. Perhaps the customer is willing to place an order for the merchandise and pick it up in a day or two.

If this is not possible or the customer does not wish to wait, suggest similar merchandise. It may be that the customer will accept the same lure with a slight color variation or the same brand of line in 12-pound test instead of 14-pound test. This sales tactic is not as likely to work if the customer is trying to buy more expensive items, like a rod or a reel. The salesperson should still suggest alternate merchandise in an effort to save the sale.

A Desire to Buy "Temporary" Equipment

Anglers often forget something when they go fishing. The forgotten item may be a favorite lure, a minnow bucket, or the reel that matches a favorite fly rod. Sometimes anglers have accidents that cause equipment breakage or loss. A rod handle may break, a fish stringer or basket may be lost in the lake, a large fish may strip all the line from a reel, or a battery for the trolling motor may run down. Depending on what was forgotten, lost, or broken, the results may range from a slight inconvenience to a halt in fishing until a repair or replacement is made.

The tackle salesperson should remember that the angler who is making an emergency purchase is often just trying to "get by" until the trip is over. As an example, the angler may want to buy an inexpensive Styrofoam minnow bucket instead of an expensive metal one (like the one left at home). On the other hand, if an item has been broken and must be replaced, the chances of selling quality merchandise are improved.

If your price for a reel (like the one the angler just dropped into the lake) is not too high, the customer may choose to replace it now instead of doing without it for the rest of the trip. Good listening and good questions will give the tackle salesperson an idea about what to recommend to this customer.

Several other customer types exist, but the ones mentioned will cover most of the customers you serve. Each customer is an individual and must be handled as such. Customers may have similar needs but not react the same way to an approach used by a salesperson. These are some of the things to keep in mind and to tell the customer when selling fishing tackle:

- Point out new items [illegible] models.
- Use testimonials by other satisfied customers.
- Stress the product's workmanship and dependability.
- Always mention the warranty, if one exists.
- Discuss the advantages of the product, including technology and materials used in its construction.

Questions

1. What kinds of records are needed by the person who orders merchandise for a tackle shop?

2. What procedure does an employee normally follow when it is discovered that damaged merchandise has been delivered to the store?

3. Knowledge about the pricing of merchandise is important. What other responsibility to the store does this knowledge require on the part of the salesperson?

4. A display may be used to remind customers of at least three things. Name them.

5. List some of the duties included in housekeeping in a sporting goods store. (Three are acceptable.)

6. Cashiering mistakes will usually cause one of two things to happen. Cite them.

7. If an inventory count shows that less merchandise is in the store's inventory than should be there, then what is assumed to have occurred?

8. If an employee receives a reel from a customer for the purpose of repairing it, what information should be put on the tag attached to the reel?

9. Define the word *security* as it applies to a store.

10. Why should a tackle salesperson "trade up" customers who have a desire for prestige in the tackle they buy?

11. What two things should a tackle salesperson emphasize when selling merchandise to a customer who is looking for dependability in a fishing tackle?

12. Define an *innovative customer.*

13. If a customer calls for a certain item of merchandise that is not in stock, what should the tackle salesperson do?

14. How does the tackle salesperson arrive at a good idea about what to recommend to a customer who has just lost a rod and reel in the lake?

15. Why do many anglers prefer to use metal lures when fishing for bluefish?

16. Why should most gaff-topsail catfish (as is true of all catfish) be handled with caution?

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Fishing Rods

Objectives: *After completing this assignment, you will be able to—*

1. *name the classifications of fishing rods and their basic functions;*
2. *explain the meaning of "sensitivity" in a fishing rod;*
3. *name the parts of a fishing rod;*
4. *explain why guides on a fishing rod must be of good quality;*
5. *tell why bait-casting rods are called by that name, and why they are often used by anglers who fish around structures;*
6. *tell why the first guide on a spinning rod is so large;*
7. *cite the type of rod that can be used to make the most natural presentation of a lure to a fish;*
8. *tell which kind of line should be used with a fly rod;*
9. *describe the specific purpose of the design of a fly rod;*
10. *describe the design and the advantages of both one-piece and two-piece surf rods;*
11. *describe the type of action on most boat and bay rods; and*
12. *cite the method of classification for most deep-sea rods.*

When a customer walks into your store and says, "I need to buy a fishing rod," what questions should you ask? These questions and the rod(s) you recommend to the customer are an indication of how "good" you are as a tackle salesperson. The basic fact that every salesperson needs to remember about fishing rods is that each is built to do a specific kind of job. Only after discovering how the customer intends to fish can the tackle salesperson intelligently recommend a fishing rod to the customer.

Your recommendation should be based upon the type of fish your customer aims to catch, the type of water at the fishing site, and the types of lures or baits the angler plans to use. Some inexpensive rods are sold as "utility" rods, but most are designed for a particular action and have characteristics that make them better-suited for certain types of fishing.

Fishing rods can be classified in various ways. The most widely used classification system is based upon the type and weight of lures the rod is designed to cast. Rods are classified as *fly rods, spinning rods, bait-casting rods,* and *saltwater rods.* Each type has its own subcategories. Some also include ice fishing rods and fishing poles as additional categories.

The Function of a Fishing Rod

Fishing rods serve two basic functions. One is to help the angler place a lure or bait where a fish is thought to be hiding. Think of how hard it would be for a person to try to throw, by hand, a fly or topwater plug that is tied to a line attached to a reel. An angler attempting this could not develop enough power to throw the lure and line very far. This would be especially hard if the reel were a casting reel. You would also discover that it is hard to be very accurate when throwing the lure. A skillful angler can cast a lure much more accurately than he or she can throw it. The rod enables the angler to cast a lure farther and more accurately than would otherwise be possible.

The second basic function of the fishing rod is to take some of the strain off the line and the angler's arm when a fish is hooked. Each year there are reports of people catching large fish on light lines. How is it possible to land a 20-pound striped bass when you are using 12-pound test line? This is possible because the rod helps in fighting the fish, by keeping the fish from directly applying its weight to the line. This is proven by the fact that many fish are able to break a line if they can wrap it around a branch or some other solid object with no spring to it. Imagine trying to land a fish without a rod. The strain on the line and the chance of your having the reel jerked from your hands would present a real challenge.

Construction of Fishing Rods

People like to buy from salespeople who know a lot about their product. If you were asked why a graphite rod is often preferred by anglers who use plastic worms, what would your answer be? What is the difference between a tubular rod and a glass rod? What is the name of the connecting device that holds the parts of a two-piece rod together?

These are only a few of the many questions that you may be asked about fishing rods. The more you know about your merchandise, the better your chances are of making a sale. The following discussion of the construction of fishing rods is divided into two sections. One describes the materials that may be used when building a rod blank. The other section emphasizes the various parts of a fishing rod.

Materials Used in Fishing Rods

The first materials used in building fishing rods were natural hardwoods such as hickory, bethabara, lancewood, and Osage orange. Bamboo then replaced the hardwoods as the primary rod-building material. Bamboo fly rods are still available today but are very expensive. They are often regarded as the "aristocrats" of fly rods. Many rod manufacturers began to produce very durable steel rods that were much easier to care for than bamboo rods. Steel rods have largely been replaced by fiberglass rods.

Fiberglass rods first appeared in the late 1940s. This material became the most widely used for rod construction and still maintains that position. In the late 1970s, however, newly introduced materials provided challenges to fiberglass. The strongest challenger has been *graphite*. Other materials include boron, Kelvar, and S-glass, a new type of fiberglass. A more detailed discussion of each of these materials follows.

Fiberglass. This material is used in two different forms, solid fiberglass and tubular fiberglass. Solid fiberglass rods are heavier, and their "action" is not as good as tubular rods. Solid fiberglass rods are very sturdy and stand up to hard use. They are relatively inexpensive. Many "utility" rods and those designed for pier and party boat saltwater fishing are solid fiberglass.

Tubular fiberglass is not quite as sturdy as solid fiberglass, but it provides a much better action. When the rod is bent, the walls on the inside of the curve are compressed and squeezed together. At the same time the walls on the outside of the curve are stretched. This squeezing and stretching creates tension, causing the rod to snap back to its original straight position. This is what is referred to as "action" in the rod. This action can be controlled by decisions on how thick the walls of the fiberglass tube are to be and on the size of the tube's core. Tubular fiberglass rods are light but very strong. They can withstand a great deal of wear but will snap if stepped on or if struck by a hard, heavy object.

Most tubular fiberglass rods are constructed of woven fiberglass cloth and resin. Fiberglass fibers run in several directions on the rods. Other rods are constructed so that almost all fibers run the length of the rod. One manufacturer refers to these as "unidirectional," tubular fiberglass rods. They are stronger and more sensitive than tubular fiberglass rods made from crisscrossed layers of fiberglass cloth and resin. Unidirectional rods are usually higher-priced.

Graphite. Rods built from graphite are generally considered to be lighter, just as strong, and much more sensitive than most fiberglass rods. Graphite was developed for use in aerospace structures requiring a light material that was also strong and rigid. At first glance, one might think that a graphite rod would not be very strong. It is usually lighter and has a much smaller diameter than fiberglass rods.

Looks are deceiving, however. These rods are very strong and have plenty of "backbone" for setting the hook and playing a fish. Since they do not bend as much as a fiberglass rod, it takes a shorter strike by the angler to set the hook. The sensitivity of the graphite rod is its biggest selling point with many anglers. *Sensitivity* refers to the ability of the rod to transmit information to the angler about what is going on under water.

Research shows that fish often inhale and exhale a bait or a lure without the angler ever being aware that it happened. It is possible for a fish to take a lure very softly and to swim with the lure in its mouth, without the angler's knowledge. One of the rules when fishing with a plastic worm is to watch the line where it enters the water. This rule is designed to help the angler know when a fish has taken the worm, even though no strike has been felt. With a graphite rod, the angler will feel many strikes that are too soft to be felt on most fiberglass rods. Worm anglers are better able to distinguish between a strike and the worm hitting a rock, grass, or brush.

One manufacturer suggests using the "pebble test" to illustrate the sensitivity of the graphite rod. In this test, a fiberglass rod and a graphite rod are rigged with the same brand and weight of fishing line. The line is played out about 20 yards. Keeping each line fairly taut, the customer holds first one rod and then the other, while the salesperson drops small pebbles on the line. The graphite rod usually will do a better job of helping the customer to feel the "hits" on the line.

Some customers may ask if it is easier to break a graphite rod than a fiberglass rod. Information from manufacturers varies. One explains that fiberglass fibers are softer than graphite and may fracture but not snap in two at the time of an accident. After enough bumps and jolts, enough fibers will fracture so that a break may occur during a cast or when the rod is in a stress situation. Graphite fibers are harder and will not usually fracture with small bumps or jolts. A solid lick to the rod—banging it down on the side of a boat or hitting a submerged limb or rock while trying to free a lure—may cause the fibers to break. When this happens, the rod instantly snaps in two. Graphite rods should not be bent more than 90 degrees.

Graphite and Fiberglass. Some manufacturers produce rods that are a combination of graphite and fiberglass. They claim that this creates a rod with the advantages of graphite but at less cost, since rods with higher graphite content cost more.

At least one manufacturer takes the position that the use of fiberglass with graphite dilutes the performance of the graphite to the point that the combination is unsatisfactory. This manufacturer claims to be able to produce 100 percent graphite rod blanks that have graphite strength but a softer action than some other graphite rod blanks.

Boron. Boron is another material that has been used in the aerospace industry. It is a natural element, not a synthetic material. Boron is very stiff but very light. It is so stiff that it must be mixed with another material, usually graphite, if it is to be used in rod construction. Most boron rods contain only 10 to 30 percent boron. Pure boron has a tendency to shatter violently when overstressed. Mixing boron with other materials usually eliminates the possibility of overstressing.

The light weight of boron is a factor in its favor. One angler, when first using a boron rod, said that it felt like he was waving around only a rod handle when he cast a lure. The weight of a rod becomes important when an angler is likely to cast several hundred times during a day of fishing.

Kelvar. This synthetic material was developed by the Du Pont Company. It is lighter and stronger than fiberglass. Kelvar is now being combined with fiberglass and graphite in an attempt to produce a rod with the best features of both materials.

S-Glass. The Owens Corning Company developed this material for the electronics industry. S-Glass is stiffer, stronger, and lighter than fiberglass. One advantage of this material is that it is only slightly more expensive than fiberglass.

The Parts of a Fishing Rod

Almost all fishing rods contain the same parts. The major parts are the *handle, shaft,* and *guides.* If rods consist of more than one piece, they will have *ferrules.* Figure 4.1 shows the names of the various parts of a fishing rod.

The Handle

The handle assembly includes a butt cap, handle, reel seat, reel screw lock, foregrip, and a chuck. The handle of a rod varies according to rod type. Bait-casting and spin-casting rods have an offset reel seat, thus making them easy to identify. Spinning, fly, and most saltwater rods have a straight reel seat.

The butt cap protects the handle. This piece is made of rubber, chromed steel, or anodized aluminum. Many handles are made of cork and easily chip and split if not protected. The butt cap is usually secured by a screw that anchors a piece of metal around which the handle fits. The butt seems to be an insignificant part of the rod, but it actually plays a very important function. The butt cap on saltwater rods usually covers an inch or more of the handle. This helps protect the handle, which is often placed in belt harnesses while the angler fights a fish. The handle may also be placed in metal holders while trolling for game fish. The extra-long butt plate absorbs much of the punishment that would probably ruin an unprotected handle.

Handles vary in length. Those on fly rods and spinning rods are usually slightly longer than those on bait-casting rods. Some rods, including bait-casting and saltwater rods, are designed for two-handed casting. The handles of these rods usually range from 8 or 9 inches up to 2 feet in length. Handles traditionally were made of cork. Newer rods often feature soft plastic or rubber handles that are molded to fit

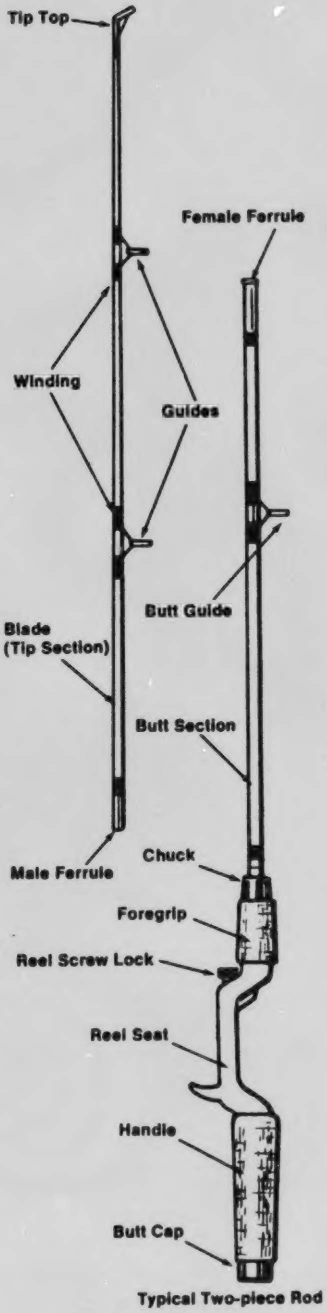


Fig. 4.1. Parts of a Fishing Rod (Courtesy American Fishing and Tackle Manufacturers Association (AFTMA), Chicago)

a person's hand. Graphite rods often have graphite handles for high sensitivity. The graphite shaft may detect a soft strike that might not be felt through a conventional handle.

The reel seat provides a place for attaching the reel to the handle. The reel seat is offset for bait-casting rods but is straight for spinning, fly, and saltwater rods. Some graphite bait-casting rods are now using graphite reel seats, only slightly offset. Reel seats have traditionally been made from chromed brass, chromed steel, or anodized aluminum. Devices used to lock the reel to the handle vary. Some have a setscrew that tightens a clasp that holds the reel. Spinning rods, fly rods, and many saltwater rods have two rings that screw inward and over the base of the reel to secure it to the rod. Larger saltwater rods use threaded bolts and a clasp to secure the reel.

The foregrip provides a place for attaching the shaft to the handle. Some foregrips have only a hole or ferrule into which the butt of the shaft is inserted. On others, a foot or so of the rod is permanently attached to the handle, and the rest of the rod must be attached with a ferrule. Still others have a place where the shaft is inserted and also have a chuck that screws downward to secure the shaft to the handle.

The Shaft

The shaft is the rod blank that has been fitted with guides, a tip top, and ferrules, if necessary. The shaft may be made of several kinds of materials, as mentioned previously. If the rod is divided into two parts, the lower part is called the butt section, and the upper part is called the tip section. Ferrules are used to join shafts that are divided into two or more pieces. A ferrule is usually made of fiberglass, stainless steel, or chromed steel. The butt section and the tip section are joined by two ferrules that fit one inside the other.

The angler must be very careful not to bend either ferrule, which would make it difficult or impossible to join the two pieces of the shaft. If the ferrules are bent while the rod sections are joined, it is possible that the rod cannot be separated into its two parts. Many manufacturers recommend using some sort of lubricant in the ferrules, since they are almost impossible to separate otherwise. Rods should not be stored with the ferrules joined. This is especially true of saltwater rods which may suffer from corrosion in the ferrules. Ferrules must be strongly attached to the rod blank, eliminating any wobble and ensuring that the rod performs as though it were a one-piece shaft. The jointed ends must slip together effortlessly, hold snugly, and separate easily when pulled apart.

The Guides

The guides on a rod are devices that are attached at various locations on the shaft. The line is strung through the guides from the reel to the tip of the rod. Guides enable a rod to use the full strength of the shaft when casting and when "playing" a fish. A rod with too few guides is not able to effectively exert its strength.

Guides are important to the lasting success of a rod. The shaft and handle may last for many years. However, guides of inferior quality must be replaced, or the handle and shaft are of little value.

During casting and when playing a fish, the line is stretched taut, which places pressure against the bottom of the guide. After several fish have been caught, an inferior guide can develop a groove that may cut the line when a large fish exerts pressure on it. A good rod will have guides that strongly resist wear. These include tungsten carbide, heavily chromed stainless steel, and those with ceramic inserts.

Guides on spinning and spin-casting rods are much larger in diameter than those on other rods. This is to accommodate the loops of line that come off spinning and spin-casting reels.

The guide at the tip of the rod is called a tip top. All rods except fly rods should have tip tops with supporting bars. This helps prevent the tip ring from breaking loose and helps keep line from wrapping around the tip. The tip top guide supports most of the pressure of casting and playing a fish. This guide is most likely to develop a groove and, if used frequently, it should be watched closely.

Saltwater rods used for offshore fishing often have *roller guides*. These guides have rollers mounted on oilless bushings or on greased, but sealed, ball bearings. As line goes through the guide, the roller turns and reduces the chance that a groove will develop on the roller.

Most guides are attached to the shaft by windings. The winding is nylon thread wrapped round and round the shaft and the leg of the guide. The winding is then tied and shellacked. The shellac seals the winding and reduces the chances of damage or of unwinding.

Some guides are mounted on rings with rubber inserts. These rings come in different sizes. A ring is slipped over the tip of the rod and is moved down to a place where it snugly fits the rod. These guides are popular with "do-it-yourself" rod builders.

Types of Fishing Rods

There is a time and a place for every type of fishing equipment. It would be ideal if each angler were skilled in the use of the bait-casting, spinning, and fly rods. The skillful angler will select the equipment best suited to his or her needs. This section describes the rods used in each category of fishing.

Bait-casting Rods

The word *bait casting* is somewhat misleading, since many rods in this category are designed specifically for certain types of lures. Bait-casting equipment today is the result of efforts in the 1800s that produced rods for the purpose of casting minnows. Fly rods had been available for a long time, but some southern anglers wanted a rod that would handle a heavier bait, so they could cast minnows out to farther distances.

The name "bait casting" has remained, even though most of today's bait-casting rods are used to cast artificial lures. Some people refer to this equipment as "plug-casting" equipment, since it was used to cast the very earliest wooden lures (called plugs) whittled by creative anglers.

Bait-casting rods are designed to handle heavier lures than spinning or fly rods (see fig. 4.2). They are shorter and sturdier than other rods, which makes it possible to turn a fish away from brush or other obstacles that may tangle the line. Many anglers look for "structure" when looking for fish. People who engage in structure fishing often prefer to use bait-casting equipment, so they can pull the fish away from the structure as soon as it is hooked.

Sometimes fish still manage to tangle the line in a bush or around a rock, but not as easily as when a fly rod or spinning rod is used. Fishing a plastic worm or lizard straight up and down through the branches of a submerged tree requires a rod with enough strength to "horse" the fish up through the branches when it is hooked.

Some anglers use bait-casting rods to land a particular species of fish. Actually, an angler can land almost any freshwater fish using a fly rod. But this requires more skill, patience, and time than most anglers are willing to invest. Since bait-casting rods are heavier, they give the angler an advantage when fishing for muskellunge, northern pike, large black bass, and some other species.

Weather conditions may also cause an angler to favor a bait-casting rod. If it is too windy for flies or spinning lures, a bait-casting lure may be heavy enough for good casting distance.

Bait-casting equipment can offer several advantages to the angler, even though it may be too heavy for some fish or for some conditions. But particularly in water with a lot of structure, the use of this equipment can serve the angler well.

Bait-casting rods are relatively short and fairly sturdy. Most are 6 feet or less in length. The lures cast by bait-casting rods usually weigh from ⅜ ounce to 2 ounces, but some rods are designed for lures as light as ¼ ounce.

Bait-casting rods used with light lures are usually long, light, and whippy. These rods are usually at least 6 feet long and may be as long as 6½ feet. Medium-action rods are usually about 5½ to 6 feet long and are designed to handle lures weighing about ⅝ ounce. A heavy-action bait-casting rod is usually about 5 feet long and may handle lures weighing up to 2 ounces.

The handle of the bait-casting rod, which is offset, enables the angler to easily place the thumb on the revolving spool of the bait-casting reel. This provides control over the revolving spool, which is critical during casting.

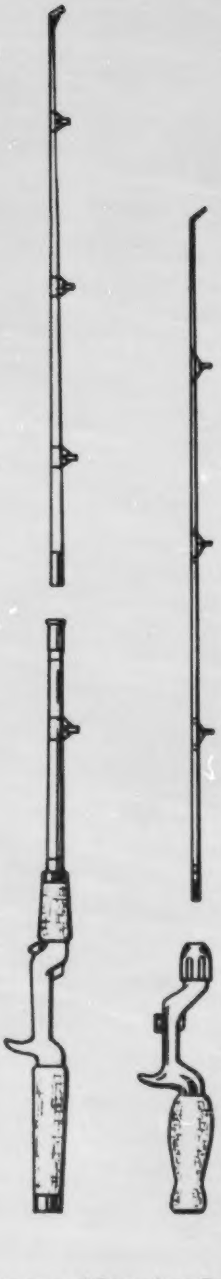


Fig. 4.2. Two-piece and One-piece Bait-casting Rods (Courtesy AFTMA, Chicago)

Shafts of bait-casting rods vary in thickness, depending on the kind of action desired. Most fiberglass shafts have a thick butt section and taper to a tip that is suited to the types of lures selected. Graphite shafts have a much smaller diameter. Heavier-action bait-casting rods are usually in one piece. Lighter-action rods may be divided into two pieces and joined with ferrules. Some bait-casting rods may be divided into three pieces, but most have no more than two pieces.

Some rods are built so that the handle and the shaft are one piece. Others are designed so that the shaft can be removed from the handle. This makes the rod easier to transport in the trunk of a car. The guides on a bait-casting rod are relatively small, since the line is straight, rather than coiled, as it comes off the reel. The length of the rod usually determines the number of guides on the rod. Most rods have a minimum of from 3 to 5 guides, and longer rods may have as many as 7 guides.

Action designations for rods differ from one manufacturer to another. Descriptions of the action designations may also differ. As a tackle salesperson, you should study charts, guides, and other literature provided by manufacturers of the equipment your store carries.

Spin-casting Rods

Spin-casting rods were developed to enable anglers to take full advantage of spin-casting reels. These reels usually sit on top of the rod and are not suited for regular spinning rods that place the reel under the rod. Spin-casting reels made it possible for anglers to cast very light lures in much the same manner as in bait casting.

To enable the angler to have more action than most bait-casting rods allowed, the spin-casting rod was developed. This rod looks much like a casting rod, but it also has some of the features of a spinning rod. Bait-casting reels can be used on spin-casting rods, but the best combination is a spin-casting reel on a spin-casting rod (see fig. 4.3).

Spin-casting rods are usually two-piece rods and are longer than most bait-casting rods. The length of these rods ranges from 5½ to 6½ feet. The action is very whippy, and these rods will handle lures as light as ⅛ ounce. Some may handle lighter lures. The best weight for lures on spin-casting rods is considered to be ¼ ounce.

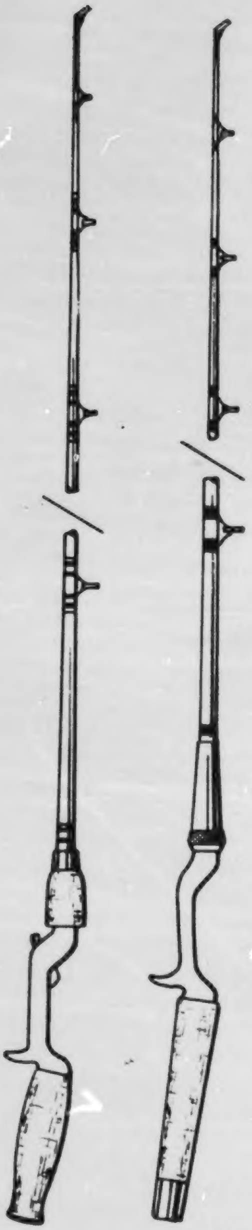


Fig. 4.3. *Spin-casting Rods (Courtesy AFTMA)*

The spin-casting reel usually has a line release button that must be pushed by the angler's thumb. Since the spin-casting reel usually sits higher than a bait-casting reel, spin-casting rods are built to place the button in easy reach of the angler's thumb. This is often accomplished by building the handle at a slight downward angle from the reel seat.

The guides on a spin-casting rod are larger than those on bait-casting reels. This is because line coming out of the spin-casting reel tends to be somewhat coiled and not as straight as that coming off a bait-casting reel. The larger guides are able to accommodate the line with the least amount of friction.

Spinning Rods

Some people think that spinning rods are used only for smaller fish, since spinning equipment can cast smaller lures. This is not true. Spinning equipment may be used for fish as small as a bream or for 7-inch-long trout. Spinning equipment is also used for many larger saltwater fish such as redfish, speckled trout, tarpon, and others. The type of water fished in often has more to do with the equipment used than the type of fish the angler aims to catch. If there are few obstructions in the water, like brush or submerged trees, spinning equipment can give the angler a real advantage.

Most anglers recognize that the size of the line used can affect the number of strikes by fish during a day of fishing. The lighter the line, the better the chances are of having a fish strike the lure.

On one occasion, I fished with a guide who used bait-casting equipment while fishing in water with a lot of brush and trees. Later that day, the guide switched to a spinning rod when casting grubs against a sheer rock cliff where there was no brush and the water was very deep. At that location, the guide, with a spinning rod, caught many more fish than I did, using a bait-casting rig. Anytime the water is very clear and the chances of snagging the lure on underwater obstructions are not too great, the spinning rod is a good choice (see fig. 4.4).

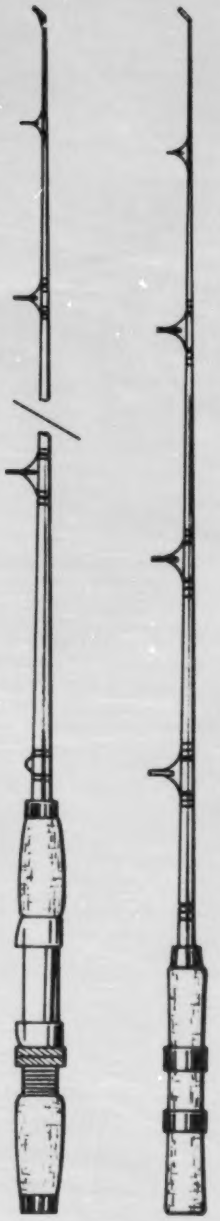


Fig. 4.4. Spinning Rod (Courtesy AFTMA)

When buying a spinning rod, the customer may choose from several kinds of actions. The ultralight rod is designed to cast very light lures, even as light as 1/32 ounce. The angler may choose a rod with an extra-heavy action, designed to handle lures weighing up to 1¼ ounces. The angler may also choose from actions that fall between ultralight and extra-heavy. Spinning rods range from 4½ to 14 feet in length.

The handle of the spinning rod is designed so that the reel is attached near the center of the handle. Most reels are designed so that the angler casts with the right hand and turns the reel handle with the left hand.

When the reel is attached to the rod, the rod is designed to be balanced at a point just in front of the reel. This enables the angler to move the rod back and forth with the least amount of effort when casting. The reel is usually attached to the rod by two rings that screw inward toward each other.

The first guide on a spinning rod is very large. This accommodates the line, which loops off the open-faced spinning reel in large coils. All the guides are larger than those found on bait-casting and fly rods. The guides are designed to reduce the size of the coils of line coming off the reel, so that the line is almost straight by the time it travels through the tip top guide (see fig. 4.5).

The guides are mounted on the bottom of the rod, usually on legs or bases. This causes the guides to be slightly farther from the rod's shaft than on bait-casting rods. This reduces "line slap" caused by the coils hitting the shaft.

Charts differ from manufacturer to manufacturer. The fishing tackle salesperson should study the charts and tables for each line of spinning rods stocked in the store.

Fly Rods

The fly rod was the first type of sport fishing rod developed. The first record of fly fishing was recorded during the third century. This rod can be used to make the most natural presentation of a lure to a fish. A good cast ends with a slight lift of the rod tip. This causes the line to be raised and the fly to first touch and rest on the water for a brief period before the leader and line touch the water. Since a light leader is tied onto the end of a fly line, fish are not as likely to notice the line as in spinning and bait casting. This makes the fly rod a favorite in small streams and in clear ponds or lakes.

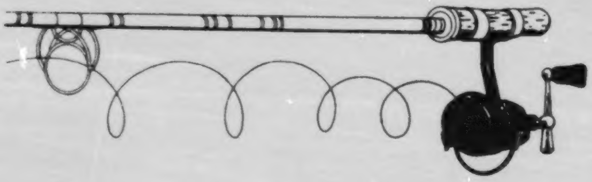


Fig. 4.5. The looping spin-off from the spinning reel requires a large first guide to prevent line tangles. (Courtesy Browning Arms Company)

Fly fishing offers a great deal of versatility in fishing. The fly rod may be used on bream in lakes or ponds, for bass in most waters, for large trout and salmon in large streams, and for tarpon or bonefish in salt water. Some anglers have discovered that channel catfish will take wet flies in streams with clear water. Other anglers use fly rods when bait fishing. And landing a good carp with a fly rod can provide a real sporting challenge to most anglers.

Fly rods come in a variety of actions, since they are used in so many different situations. It is important that the angler buy a rod best suited to a particular type of fishing. A rod designed for short casts with a dry fly over a small brook would probably not be suitable for casting a heavy streamer fly to salmon in a large river or to tarpon in a bay or tidal river. A fly rod for all-around fishing is 8 to 8½ feet long and weighs from 4 to 5 ounces.

A rod measuring 6 to 7½ feet and weighing from 2½ to 3½ ounces can be used for very light dry fly fishing. For heavy fishing, the rod should be from 8½ to 9½ feet long and weigh at least 4½ ounces. It is extremely important to match fly fishing equipment with the appropriate fishing line. Most manufacturers mark the fly rod with the weight of fly line that best matches it.

Most fly rods are made of tubular fiberglass. Some are made of bamboo and are very expensive. Graphite fly rods are fairly common and are favored by many anglers. The shaft of most rods is divided into two pieces, but many of the longer shafts are divided into three pieces (see fig. 4.6).

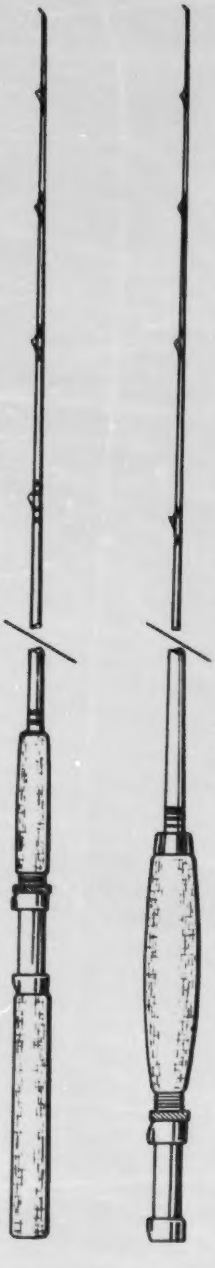


Fig. 4.6. Fly Rods (Courtesy AFTMA)

The action of a fly rod is designed to cast a line, not a lure. This is different from bait-casting or spinning rods. Fly rods are usually longer in order to provide the action needed and to allow room for the line to pass above the angler's head.

Balance is important in a fly rod, and the balance point should be located where the angler's hand grasps the rod. Many rods are designed for the reel to be placed at the butt of the handle. Other rods have longer handles and place the reel near the middle of the handle. Screw rings are ordinarily used to fasten the reel to the rod.

The guides should be large enough to enable line stripped from the reel to shoot throuth with little friction when a cast is made.

Remember that matching line to rod is very important in fly fishing. Be sure to make this point clear to your customer. If you handle the sale skillfully, you should be able to sell the customer the type of line recommended by the manufacturer for the rod being purchased.

Saltwater Rods

An angler who has fished only for freshwater fish often assumes that new equipment must be purchased for saltwater fishing. This is generally not true if the angler plans to fish in bays and tidal flats. Most of the fish caught by saltwater anglers can be handled on good freshwater equipment.

Many new saltwater anglers arm themselves too heavily for the majority of the fish they catch. A medium- or heavy-action bait-casting rod or spinning rod, equipped with a stainless-steel reel, will handle most speckled trout, redfish, flounder, and other fish found in the bays. Knowing that a very large fish may be hooked at any time makes all saltwater fishing, especially bait fishing on the bottom, a thrilling sport. However, this happens only occasionally. The use of relatively light tackle increases the pleasure of saltwater fishing.

There are times when rods specifically designed for saltwater use are desirable. For the most part, surf rods are designed for casting lures or bait long distances. Boat or pier rods are usually designed to quickly land a fish in situations requiring little effort to "play" the fish. Deep-sea rods are very solidly designed and built to handle very large fish. Each of these saltwater rods is briefly discussed in the following section.

Surf Rods

These rods are designed more for casting than for playing fish. They must have the backbone necessary to enable the angler to cast the lure great distances. This is often necessary to reach schools of fish that may be feeding several yards offshore.

The most popular surf rods are spinning rods with heavy actions. The heavy-surf spinning rod may be from 10 to 14 feet long. The butt of the shaft is very powerful, but the tip is usually light enough to handle a range of lures. The first guide on a saltwater spinning rod is usually much larger than on regular spinning rods. Most surf spinning rods are made of tubular fiberglass (see fig. 4.7).

Conventional surf rods are still used by many anglers. These range from 7 to 14 feet long but most are in the 8- to 10-foot range. Most are designed to handle bait or lures weighing from 2 to 4 ounces. These rods are built as one- and two-piece rods. Most veteran anglers recommend the one-piece rod.

Two-piece rods were developed mainly to make it easier to transport the rods from home to the beach. Most of these are made of tubular fiberglass. The handle of the rod often measures 30 inches from the butt cap to the reel seat.

Guides should be the best available. Agate is considered to offer the least friction to the line as it goes through the guide. Carboloy is hard but provides more friction than agate.

Popping rods are a link between surf rods and saltwater bait-casting rods. These rods are good for short-range surf casting and usually handle lures in the 1- to-2½-ounce range.

Boat and Bay Rods

Many saltwater anglers fish on piers, jetties, and party boats. In these situations, it is common for several people to fish very close together. On a party boat, for example, only 3 or 4 feet may separate anglers. When a fish is hooked by a party boat angler, all other anglers often reel in their lines to prevent tangles. This is sometimes practiced on piers, especially when a large fish is hooked.

In these situations, it is important that the angler land the hooked fish as quickly as possible. When 10 to 20 other paying party boat customers are waiting with reeled-in lines, it is not a good time to "play" a hooked fish. And, while other anglers on a pier have their lines out, it's not a good idea to let a hooked fish "run," if it can be prevented. Boat and bay rods are usually rather heavy and are designed to put fish into the boat as quickly as possible.

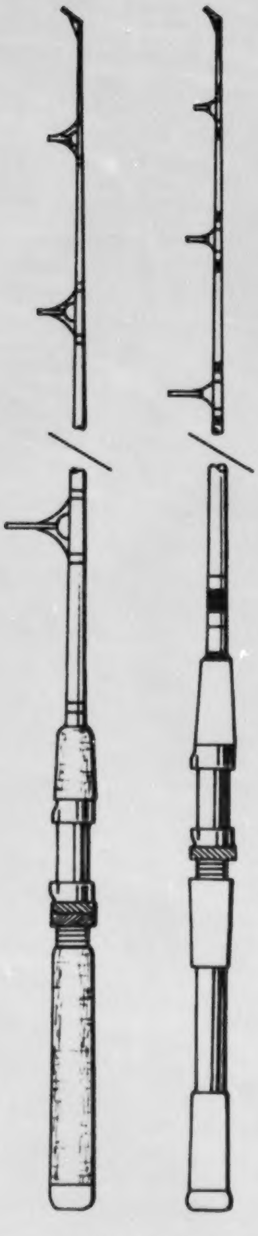


Fig. 4.7. Surf Spinning Rods (Courtesy AFTMA)

Boat and bay rods (fig. 4.8) vary in length. Many are rather short. Longer rods are sometimes handy in holding fish away from bridge and pier supports. If the rod is used in a boat, the shorter length will usually be preferable, since it is easier to handle.

Deep-Sea Rods

Deep-sea rods are used to fish for large saltwater fish such as sailfish, marlin, tuna, and mako sharks. Some anglers who fish for sharks from piers often use deep-sea rods, and it is not unusual for them to catch sharks in the 12-foot class. Anglers who anticipate hooking a fish of this size will usually use a heavier rod than the typical boat and bay rod.

Deep-sea rods (fig. 4.9) must be solidly built to stand up to the strain a strong fish will place on them. The quality of the rod is especially important when you consider that an angler would be accounted lucky if one billfish were hooked each day. It is not unusual for an angler to fish three or four days and see only one or two good fish.

When a good fish does hit the bait and is hooked, the angler deserves to be using a rod that will stand up. For a handle to break or for a support to snap under the strain of the fish would be a disaster. Anglers who engage in deep-sea fishing can usually afford the price of a quality rod, and they expect quality in the equipment they buy.

Handles are usually constructed of hardwood. Most will have a notch in the bottom of the metal butt cap. This notch or deep groove fits over a heavy pin located in the gimbal, which is mounted on the angler's fighting chair. The gimbal is a deep cup that supports the butt of the rod while the fish is played. The notch and pin arrangement gives the angler good leverage and mobility when raising or lowering the rod while fighting the fish.

Guides on deep-sea rods must be of top quality. Roller guides with self-lubricating bearings are the best. The supports must be able to take the strain of the line when a heavy fish is hooked.

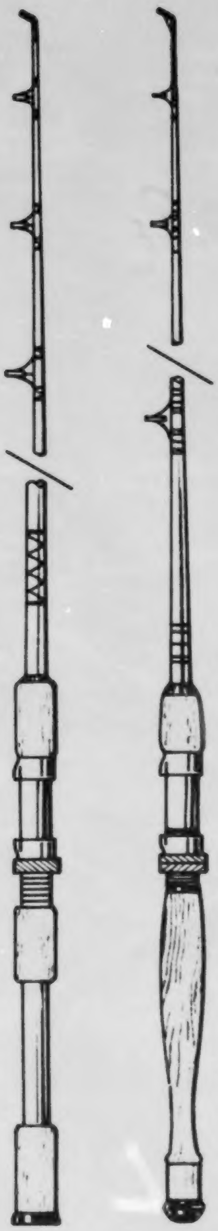


Fig. 4.8. Boat and Bay Rods (Courtesy AFTMA)

Most deep-sea rods are classified according to their *line test classification.* As explained by the American Fishing Tackle Manufacturers Association, in their booklet, *All About Fishing Rods,* "To take a fish that would be eligible for record purposes in the 'under-30-pound line test classification,' one should purchase a rod rated as a '30-pound class' or less rod. Such classification of rods really is just another way of identifying their actions, from 'light' to 'medium' to 'heavy.' In this vein, rods usually are listed as 30-, 50-, or 80-pound class."

Ice Fishing Rods

These rods are usually short, measuring less than 4½ feet long. This short length enables the angler to stay close to the hole in the ice and still handle the rod. Most of these rods have rather light actions, since mostly panfish are caught through the ice, and heavy actions are not often necessary to handle them.

Ice rods do not usually have reel seats (see fig. 4.10). Reels may freeze up in subzero temperatures. Most ice rods have one to three guides and a tip top; some have only a tip top. Some anglers attach a springy wire extension with a line guide to the tip of the ice rod. When a fish lightly mouths the bait, the angler can usually see the movement in the wire extension. Since casting and action are not very important in ice fishing, many ice rods are made of solid fiberglass.

Fishing Poles

A *cane fishing pole* is what many people think of when they hear the words, "fishing pole." The cane pole, made of heavy calcutta cane, is still widely used by many who fish with bait from the shore of a lake or stream. Cane fishing poles come in one-piece, two-piece, and three-piece models.

It is extremely important that two- and three-piece poles have good ferrules. If the ferrules are weak or are not properly joined to the ends of the sections of the pole, the pole will not be straight. Some poles are joined by ferrules that screw together and securely fasten to the pole sections. A good jointed pole is an excellent selection for the young angler who is learning to fish.

Today's fishing poles are more sophisticated than the first ones. Several manufacturers have improved upon the cane pole idea by producing fiberglass poles (see fig. 4.11). These newer poles are designed for more than bank fishing. Many anglers have learned that straight up and down fishing with a plastic worm, jig, spinner

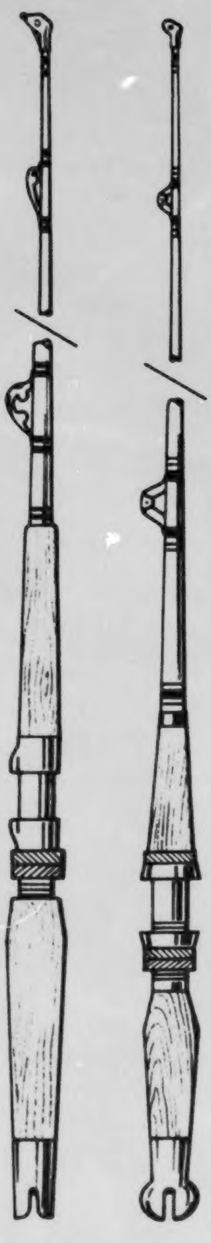


Fig. 4.9. *Deep-sea Rods (Courtesy AFTMA)*

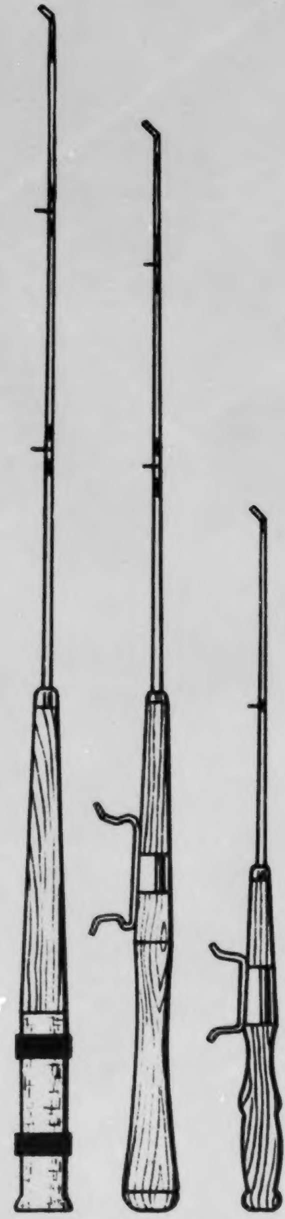


Fig. 4.10. *Ice fishing Rods (Courtesy AFTMA)*

bait, or spoon can be very effective on bass. This must be done in a way that does not frighten the fish.

Since the pole provides more length than most fishing rods, the angler can sit in a boat or in an inner tube and use the pole to lower a bait into the top of a submerged tree 10 feet away. This same approach is used with minnows, small jigs, or small spoons by anglers fishing for crappie. This technique can be very deadly during the early spring when crappie are spawning.

Some fishing poles have built-in reels and lines. It is possible that a pole will have a reel seat or rings used to secure a reel to the pole. Most, however, do not provide for the attachment of a reel to the pole. Guides are not usually found on the fishing pole, but most will have a tip top.

One-piece fiberglass fishing poles are also manufactured, but these often create a transportation problem. Manufacturers have been very successful in maintaining good action in telescopic jointed poles, and these are popular with many anglers.

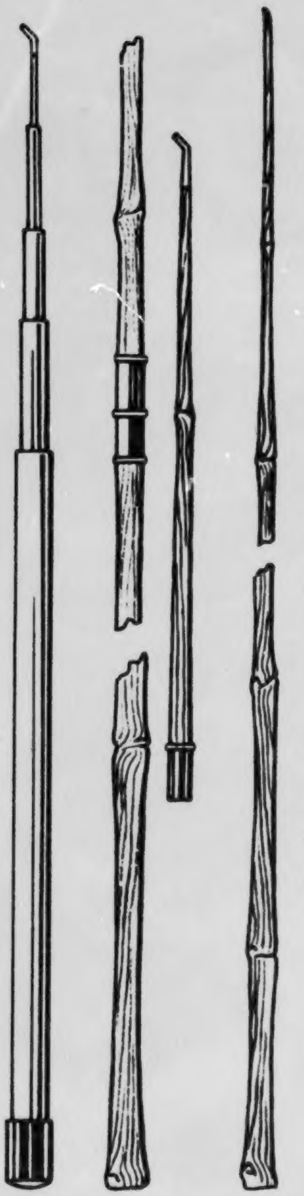


Fig. 4.11. Fiberglass Poles (Courtesy AFTMA)

Questions

1. What basic fact should every tackle salesperson remember about fishing rods?
2. How are fishing rods usually classified?
3. List the two basic functions of a fishing rod.
4. Name the most widely used material in the construction of fishing rods and its strongest challenger.
5. Tell what *sensitivity* in a fishing rod means.
6. What advantages does *graphite* provide in fishing rod construction?
7. Name the parts of a fishing rod.
8. Why is it important that the guides on a fishing rod be of high quality? What materials best resist line wear?

9. Which kind of fishing rod was first developed for sport fishing?

10. Why are *bait-casting rods* called by that name?

11. Why is bait-casting equipment often used in structure fishing?

12. Are some people correct in thinking that spinning rods are used only for smaller fish since spinning equipment can cast smaller lures?

13. State why the first guide on a spinning rod is so large.

14. Which type of rod should be used to make the most natural presentation of a lure to a fish?

15. How does one know which line to use with most fly rods?

16. Is a fly rod designed to cast a line or a lure?

17. What is a *surf rod* designed to do?

18. Do most veteran surf anglers favor the one-piece or the two-piece rod? Why were two-piece rods developed?

19. Why do boat and bay rods have very heavy actions?

20. How are most deep-sea rods classified?

Projects

1. Collect as many catalogues as possible from manufacturers who sell fishing rods to your store. Keep these in a notebook for quick reference.

2. Select a fly rod, spinning rod, bait-casting rod, and saltwater rod from your store's inventory. Develop a feature-benefit sheet for each rod.

3. Find out who manufacturers the various parts used to make the fishing rods sold to you by your suppliers. Write each manfacturer for technical information about processes used in developing materials. Keep this information in a notebook.

5

Fishing Reels

Objectives: *After completing this assignment, you will be able to—*

1. *state a major purpose of a modern reel;*
2. *describe the kinds of product knowledge a tackle salesperson should have about reels;*
3. *tell how a backlash occurs;*
4. *state the purpose of the reel spool;*
5. *tell what the term* ***free spool*** *means;*
6. *state the purpose of a drag on a reel;*
7. *describe the position of the spool on a spin-casting reel;*
8. *cite the purpose of the nose cone of a spin-casting reel;*
9. *explain the purpose of the design of most spin-casting reels;*
10. *tell why spinning reels are mounted under the rod;*
11. *cite the three line pickup systems on a spinning reel; and*
12. *name the two types of fly reels and their main function.*

Darrell was at work at Reed's Tackle Shop when a woman walked into the store. She told Darrell that she wanted to buy a birthday present for her husband. She said that he had been talking about the Ajax 7101 reel, and she would like to see one. As Darrell placed the reel on the counter, she asked the price.

"This reel retails for $79.50," said Darrell. "It is a top-of-the-line reel with a star drag, free spool, level wind mechanism, and a ball bearing action."

"Did you say $79.50?" asked the customer. "That's ridiculous! What is that reel supposed to do that a $10.00 reel won't do? They will both pull in a fish, if he ever catches one. Why would a reel cost that much?"

Recommending a Reel

It's unlikely that many of your customers will be as ignorant about fishing reels as Darrell's customer. It is true, however, that many people don't know very much about them. Like Darrell's customer, some think that reels just hold line and are used to pull in a fish. The truth is that the earliest reels were used mainly to hold extra line. Later, they were improved to help the angler reel in a fish.

Modern fishing reels still perform those two functions, but a major difference exists between modern and early reels. Most of today's reels are designed to help the angler deliver a lure or bait to a place where a fish might be hiding. Most anglers now consider this function to be as important as those of holding line and pulling in fish. The major exception to all this is the fly reel, used mainly for storing line.

Except for a boat, motor, or electronic equipment, a fishing reel is usually the most expensive piece of fishing gear owned by an angler. A good reel may cost twice as much as the rod, but the experienced angler recognizes its importance in making a day of fishing most enjoyable.

Smooth, accurate casts also increase the pleasure of fishing, as do smooth retrieves. For these and other reasons, the experienced angler is usually willing to pay for quality construction and workmanship in a reel.

In order to better serve your customers, you should learn as much as possible about reels. Customers are more likely to buy if the salesperson is familiar with the merchandise. This is especially true of an experienced angler shopping for a reel. Your product knowledge should include information about the materials used in constructing the reel, the reel design, the reel mechanism, special features, and care of the reel.

As a tackle salesperson, you should be familiar enough with your reels to recommend one that will meet a customer's needs. Selling a fishing reel should mean *selling satisfaction*, or helping the angler catch more or bigger fish.

The reel you recommend to a customer will depend on several things. These include the customer's fishing experience, fishing preference, where he or she is planning to fish, lures or baits to be used, and the amount of money the customer can afford to spend.

Most experienced anglers agree that the salesperson should always remember one key point when recommending and selling fishing reels—that is, an inexpensive fishing reel is often a very poor bargain. Since a reel is a piece of machinery, quality materials and construction are important to its smooth operation. They also contribute to a long life for the reel.

In most cases, the best bargain is the most expensive reel the angler can afford to buy. An angler invests too much money in a fishing trip to take a chance on having it ruined by a faulty reel. Your job is to assist the angler in buying the reel that best satisfies his or her fishing needs. This assignment presents information about fishing reels that will help you to better serve your customers.

Bait-casting Reels

The very earliest bait-casting reels were designed for the purpose of casting minnows to locations in a river where fish were likely to be. They were often made by watchmakers and other who knew how to construct and fit precision gears. These early reels were, and still are, considered to be pieces of precision machinery. They did not have many of the features of today's bait-casting reels. Drags, level wind mechanisms, and brakes were later inventions. These reels, though similar, were not mass-produced. Each was a unique piece of craftsmanship.

In the early 1800s, people in various parts of Kentucky began to develop reels that led to today's modern bait-casting reel. During this time, gears were first used to cause the spool to spin more than once each time the reel handle was turned a full revolution. These bait-casting reels continued to be improved, as more people began to experiment and to add new features to them. This improvement process continues, and today's bait-casting reels are much improved over those manufactured only 10 or 20 years ago.

The purpose of the bait-casting reel has also changed over the years. While early reels were used to cast bait, most of today's reels are used to cast lures. This has brought about a need for reels that can handle a variety of lure weights and recently has resulted in the high-speed retrieve feature on some reels.

Using a bait-casting reel requires patience, and most anglers agree that this is the most difficult type of reel to learn to use. Modern reels with antibacklash features make it easier to learn to cast than was true with earlier reels. The main problem encountered by today's angler is that the spool may spin too rapidly. If this occurs, the line may not leave the reel quickly enough, causing the line to become badly tangled. This tangle of line is called a *backlash*. Since it is as hard to untangle as a string woven into a bird's nest and several loops of line are left sticking out of the tangle, it is commonly referred to as a "bird's nest."

A backlash is always possible, even if the angler is very experienced and is using a modern reel. Today's reels often have many features that help reduce the risk of a backlash. It is only through practice that an angler can develop great skill in using a bait-casting reel.

The advantages of bait casting justify an angler's efforts to become a skilled caster. Bait casting enables an angler to fish in water with many obstructions, such as brush, trees, rocks, and reeds. The heavier line used on a bait-casting reel enables the angler to pull a large fish from such water.

Another advantage enjoyed by the skilled bait caster is the ability to cast very accurately. One skilled in bait casting can literally cast within inches of a target, even from several yards away. This is possible, since the angler is able to use the thumb to control the cast during most of the time the lure is in the air. This casting accuracy is necessary for successful structure fishing.

Features of the Bait-casting Reel

Listing the features of a bait-casting reel is similar to listing the features of an automobile. Several features are common to all bait-casting reels, but many more are optional. Reels differ, just as cars differ. As the price of the reel increases, the number of features usually increases.

The least expensive bait-casting reel consists of two side plates connected by small metal tubes called *pillars* (see fig. 5.1). This frame is attached to the *foot* of the reel, which is secured to the rod. Between the two side plates is a spool, which is connected to a gear. That gear interlocks with another gear connected to the handle of the reel. As the handle is turned, the spool turns to reel in line. Another gear, directly or indirectly attached to the handle, is also connected to the level wind mechanism. The level wind mechanism winds the line evenly onto the spool. All of these features are found on practically all bait-casting reels manufactured today.

Even a simple reel, like the one just described, can be a good one. Quality depends on materials and workmanship. Most simple bait-casting reels manufactured today are not considered to be of high quality, since so much emphasis is now placed on casting. The simple reels are best used for still fishing or for light trolling.

Although some of the basic parts of the bait-casting reel have been mentioned, a more thorough discussion follows.

The Spool. The spool of a reel actually holds the line. On an inexpensive reel, the spool may be only a round metal bar. A higher-quality reel often has an aluminum or plastic spool with a much larger diameter than the small metal bar found on an inexpensive reel. Other reels are furnished with wooden or metal arbors that snap around the small metal bar. This greatly increases the size of the spool.

A large spool enables the reel to cast more smoothly. A spool full of line will enable an easier, smoother cast than a spool only half filled with line. The full spool does not have to turn as many times to allow 25 yards of line to leave the reel as would be necessary if the spool were only half full.

Also, the large spool filled with line usually weighs less than a small spool filled with line. If the spool and line weigh less, the spool does not build up as much momentum during the cast. This helps the angler keep the spool under control and helps to eliminate backlash.

The Level Wind Mechanism. This device moves back and forth to wind the line evenly onto the spool. Early reels and even some modern saltwater reels lack this feature. If this device is not on a reel, the angler must use a thumb or finger to wind the line evenly onto the spool. If this is not done, the line tends to build up on one part of the spool. This makes it possible for a high ridge of line to fall over or be pulled over, causing all the line on the spool to become tangled.

The level wind mechanism is attached to a gear that, in turn, is connected to gears attached to the spool. As the spool turns, the level wind also moves back and forth across the face of the reel. The line guide is a piece of looped metal through which the line travels as it goes from the spool to the first rod guide.

The base of the line guide is threaded and fits over a special pillar and a threaded shaft. This threaded shaft, called a "worm gear," is attached to the gear connected to the spool. As the shaft turns, the line guide follows the threads and moves back and forth.

The threaded shaft and the threaded line guide must be constructed with precision. On a good reel, the line guide immediately begins moving in the opposite direction as soon as it reaches the end of the threaded shaft. This happens so smoothly that the line guide seems to be in continuous motion with no stops or jerks.

The newest quality bait-casting reels have a level wind mechanism that completely disengages during the cast. Therefore, only the spool turns. This feature reduces friction and allows

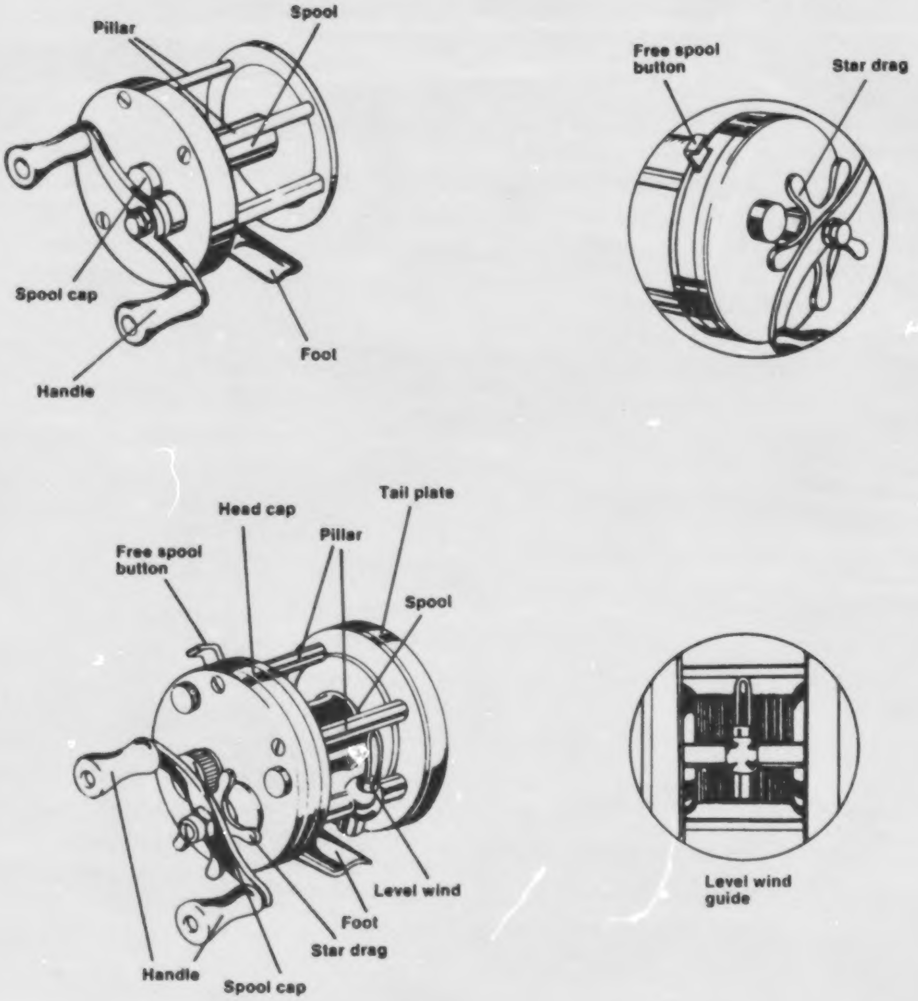

Pillar
Spool
Spool cap
Foot
Handle
Free spool button
Star drag
Tail plate
Head cap
Pillar
Free spool button
Spool
Level wind
Foot
Star drag
Handle
Spool cap
Level wind guide

Fig. 5.1. *Parts of a Bait-casting Reel (Courtesy AFTMA)*

for smoother, easier casts with less effort. When the handle is engaged after the cast is completed, the level wind mechanism engages immediately. This feature is very popular today, despite the extra cost.

The Free Spool. An angler interested in maximum casting distance will usually ask for a reel with the free-spool feature. The term *free spool* refers to the mechanism that allows the spool to be disengaged from almost all gears during the cast, achieved by pressing a free-spool button or a thumb bar. The mechanics of this action varies from reel to reel.

Pressing the free-spool button on most reels causes the spool to be separated from all gears except those that control the level wind device. During the cast, the spool is free to turn with as little resistance as possible. The better reels use stainless-steel ball bearings to provide even less resistance and longer casts. In addition to making the cast smoother, a free spool makes it possible to cast lighter lures.

As soon as the reel handle is turned, the spool is again engaged. It will stay engaged until the free-spool button is pressed again.

A free-spool reel is preferred by most experienced anglers. There are a few important things to note, however. First, remember that the reel handle must be turned to reconnect the spool to the gears. If the angler does something to cause the spool to spin after the cast is completed and before the gears are engaged, a backlash will usually occur. This often happens when a fish strikes the lure just as it hits the water.

In bait fishing, always engage the spool after a cast. Otherwise, a fish might strip all the line from the reel without the angler being aware of what is happening. Also, remember not to push the free-spool button if the line is under tension. This can be done by keeping a thumb on the spool. Unless the thumb is there to keep the spool from spinning, the tension of the line will cause the spool to spin, and a backlash will occur.

The Antibacklash Device. This feature helps to keep the spool from overrunning itself during a cast. This means that the spool is kept from spinning so fast that line piles up in the reel, causing a backlash. Anglers have always used a thumb to control the speed of the spool. The main time for concern is when the bait or lure is about to hit the water. As this occurs, no more line is pulled from the reel.

At this point, the spool is spinning very fast and has built up a lot of momentum. Unless it is stopped at the same time line quits leaving the reel, too much line will spin off the spool and become tangled. Some manufacturers have perfected systems that help control the speed of the spool during the cast.

Some reels have a centrifugal brake that helps prevent overspinning at the beginning of the cast. This brake consists of a shaft inside the reel. Small pieces of plastic or other synthetic fabric are attached to the ends of the shaft. These can be removed and exchanged or replaced. This is useful in controlling the speed of the spool and is especially helpful when changing from a heavy to a light line.

In addition to the centrifugal brake, many reels have a mechanical brake designed to control the speed of the spool at the end of the cast. This is usually adjustable, with a knob found on the side of the reel. The brake can be adjusted to match the lure being cast. It is very important to reset the brake if a lure of different bulk or weight is tied to the line.

A reel that is adjusted to cast perfectly with a ½-ounce lure will not usually cast a ⅜-ounce lure in the same manner. A backlash will often result if the angler is not alert. To adjust the brake to specific lures, the lure should hang down about 2 feet from the rod tip. Loosen the brake until the spool begins to turn and to slowly and smoothly allow the lure to drop to the water.

The Drag. A drag is a device that puts tension on the line as it is pulled from the spool. This often prevents a heavy fish from taking all the line off the reel. The drag makes the fish work harder as it strips line off the reel. The drag is adjustable and can be set to accommodate the strength of line on the reel.

It is possible for a drag to be set too tightly. When this happens, the line can break before the drag allows line to be pulled off the spool. A drag that is too loose or too tight can result in the loss of a good fish.

Some anglers suggest setting the drag just tight enough to allow the angler to strip line from the reel without straining. Others prefer not to set the drag so tightly. The drag is intended to help tire the fish, not to prevent its taking line from the reel.

A *star drag* is adjusted easily by turning a sprocket-shaped handle that looks like a five-pointed star. Although an angler can adjust the drag while fighting a fish, new anglers should be cautioned about this practice. Fish are often lost while the angler pays too much attention to the drag or when the drag is accidently tightened too much. The drag should be set before a cast is begun.

Most reels allow the angler to disengage the drag during the cast, usually by a button or a lever on the reel. Free-spool reels automatically disengage the drag when the free-spool button is pushed.

The High-Speed Retrieve. Many of the modern bait-casting reels are geared to retrieve a lure at a faster-than-normal speed. This is accomplished by changing the combination of gears so that one turn of the handle causes the spool to spin several times. A major manufacturer advertises that its fast-retrieve reels have a 4.7 to 1 retrieve ratio. This ratio varies from one manufacturer to another.

The high-speed retrieve feature gained popularity during the early 1970s. One reason for this was the discovery that spinner bait lures and some others were very effective when buzzed across the top of the water. To do this, the angler could hold the rod tip very high and reel as fast as possible. The high-speed retrieve feature enables the lure to be retrieved just as quickly, but with much less effort.

Other Considerations. The gears on a good bait-casting reel are an example of quality and precision workmanship. Most customers are impressed with the inner workings of a reel. For this reason, the salesperson should use this as a selling point and show the customer the inside of the reel.

Various materials have been used to construct gears. The most effective materials will stand up to heavy work but will not corrode. Brass is often used, and some synthetic materials such as nylon.

One manufacturer attempted to use plastic gears several years ago. They worked fine until they overheated and expanded. This caused the reel to "lock up" and be out of commission until the gears were replaced. Today, some manufacturers coat their gears with Teflon or a similar coating to make the surfaces of the gears less resistant as they come in contact. This enables the reel to perform more smoothly.

Stainless steel is another metal that has been used in reels for a good while. This metal is often used on pillars and spools and for screws, level wind mechanisms, and other parts. Some of the better reels use stainless-steel ball bearings to allow for very long casts with a free-spool reel.

The modern bait-casting reel made for the discriminating angler is a piece of precision machinery (see fig. 5.2). As a fishing tackle salesperson, you should become familiar with the working parts of the reels you sell. You can begin by taking apart and putting back together a simple reel. Then do this with a more complex reel.

In a short time, you will gain familiarity with all your reels and will then be able to "show" as well as "tell" a customer how a reel works. When you can do this, you are on your way to becoming a good reel salesperson.

Spin-casting Reels

A spin-casting reel is probably the easiest reel to learn to use, and a large number of the reels bought for beginners are of this type. One reason this reel is so easy to use is that it seldom backlashes. Since its spool does not spin, there is not a problem of the line spinning off the spool once the cast is completed.

A good spin-casting reel is durable, and will provide years of service. This type of reel handles a wide range of lure weights and can be used for several types of fishing. It is good for still fishing, but it can stand up to hours of casting. The spin-casting reel is not only for beginners. Some anglers who fish a great deal more than the average person also prefer to use these reels. The preference rests with the customer. Some bait casters like to keep a small spin-casting reel in the tackle box for use in small streams and in places where little casting space is available.

Figure 5.3 identifies several of the parts of a spin-casting reel. Refer back to this figure from time to time as you read about the reel's features.

The Push-Release Button

This is also referred to as a push button. On most reels, it is located on the back of the reel. The button is high on the back of the reel, so the thumb naturally rests on the button. The buttons on most reels are shaped to fit the shape of the thumb. As the button is pushed, the line pickup pins on the winding cup are depressed. In this position, they will not catch the line as it winds off the spool. Once the push-release

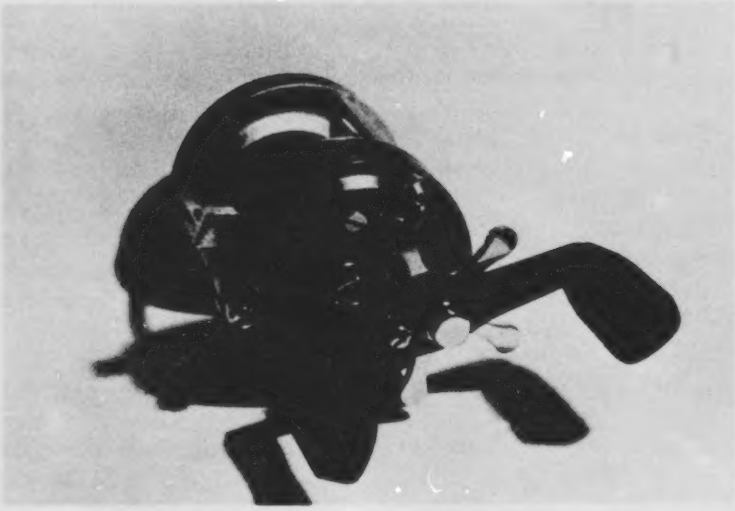


Fig. 5.2. Bait-casting Reel
(Courtesy Oshman's Sporting Goods, Austin, Texas)

button is pushed, it must be held down until the cast begins. If the button is released too quickly, the lure will drop to the water and must be reeled in again before it can be cast. After the cast begins, the thumb is raised from the bottom at the proper time, and the lure flies toward the target.

The push-release button can be used to stop the lure. If the lure overshoots the target and is about to go into a tree or other obstacle, a quick push on the button will stop the lure instantly. When the button is pushed fully forward, it moves the winding cup forward and the line is caught between the winding cup and the nose cone. A rubber ring on the winding cup usually protects the line during this procedure. Some push-release buttons are found on the side of the reel. These are often connected to the reel's handle. Even these reels sometimes have a thumb control that is used to stop the cast. The push-release button does not usually allow the angler to slow down the lure. This is possible by thumbing the spool when casting with a bait-casting reel, but not with a spin-casting reel.

The Spool

The spool of a spin-casting reel is stationary. It does not turn during the cast or during the retrieve. Unlike the spool of a bait-casting reel, the spool of a spin-casting reel is similar to a short and fat tube. One end faces the front of and is not connected to the reel. The other end connects to the body of the reel.

When a cast is made, the line just slips off the open end of the spool and follows the lure as it approaches its target. In a bait-casting reel, the spool or tube has to turn for the line to leave the reel. In the spin-casting reel, the spool does not move, but other moving parts of the reel wind the line onto the spool.

The Winding Cup

The winding cup is the device responsible for placing line on the spool. As the reel handle is turned, the winding cup revolves. On the edge of the cup is at least one *pickup pin.* When the handle is turning forward, this pin sticks out of the edge of the winding cup and catches the line as it winds around. Once it catches the line, it lays it evenly upon the spool as the winding cup revolves.

During a cast, the pickup pins do not stick out of the winding cup. As soon as the push-release button is pushed, the pins retract into the winding cup. This allows the line to fall off the spool as soon as it is pulled on by the lure during the cast. As soon as the cast is completed and the reel handle is turned forward, the pickup pins reappear and engage the line.

On some reels, the winding cup revolves only in one direction and is used only to pick up line. In other reels, the cup can be allowed to revolve in the other direction. This is usually regulated by a lever found on the side of the reel. If the winding cup does revolve while line is being stripped off the reel, it is usually a part of the reel's drag system. The pickup pins are still out and help control the line as it is stripped off the reel.

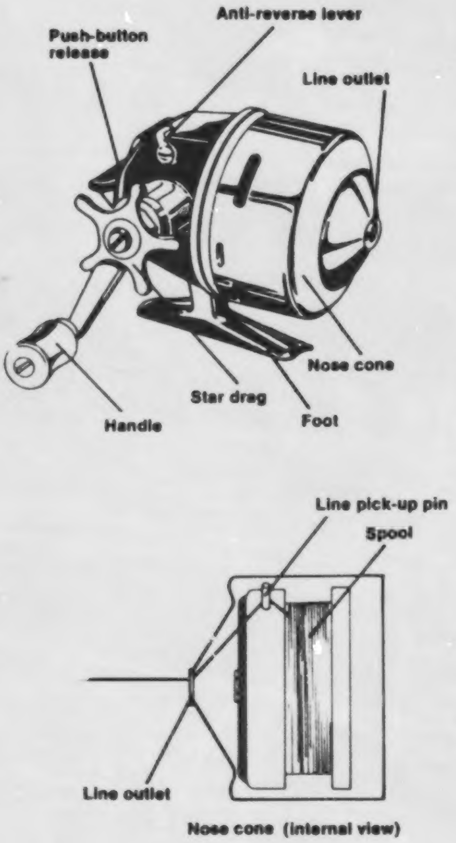


Fig. 5.3. Parts of a Spin-casting Reel (Courtesy AFTMA)

The Nose Cone

A nose cone is a fat metal or plastic cone with a small hole in the end. The large, open end of the cone fits over the winding cup and the spool. The cone is usually threaded and screws onto the body of the reel. Since the cone covers the spool, many people call a spin-casting reel a *closed-face reel* or a *closed-face spinning reel.*

The nose cone helps to control the line as it is wound onto the spool and as it leaves the spool. The line must leave and enter the reel through the small hole in the front of the cone. As the line runs from the spool, it must bend slightly as it goes through the hole in the cone. This puts the line in the position of crossing the edge of the winding cup. As the pickup pins emerge from the winding cup, they easily catch the line as the cup revolves. The pickup pins would never catch the line if it left the spool freely.

The nose cone also helps to control the size of the loops of line that come off the spool. Since the line must go through the small hole, the loops are eliminated before they ever leave the reel. This helps to reduce the chance of the line becoming tangled. This also makes it possible to use a spin-casting reel on a bait-casting rod. The guides on a bait-casting rod are too small to accommodate loops of line like those coming off a regular spinning reel. This is not a problem with a closed-face spin-casting reel.

The rubber cushion or rubber ring used to stop a cast or to prevent line from leaving the spool usually comes into contact with the nose cone at some point. The rubber cushion is usually located on the winding cup and is designed to push the line against the cone when the push-release button is pushed fully forward.

The Handle

Some reels have one knob on the handle, and others have two. Some handles are round, while others are flattened to fit the shape of the thumb and the finger as they hold the knob. There is no proven advantage to either type, and the handle is considered to be strictly a customer preference item.

The Drag

Most spin-casting reels have a star drag that places tension on the line when it is stripped from the reel. It works in the same way and is similar in appearance to the star drag on a bait-casting reel. The drag system on some reels is controlled by a knob that is turned to tighten the drag (see fig. 5.4).

Spin-casting reels are usually designed to be attached to a bait-casting rod with an offset handle. These reels sit on top of the rod. The foot of the reel is attached to the rod, just as on a bait-casting reel. A spin-casting reel can be placed on a spinning rod, but the push-release button usually is positioned too high for the angler's comfort. Spin-casting reels designed for use with spinning rods hang underneath the rod.

Many anglers who use spin-casting reels that sit on top of the rod like to palm the reel during the retrieve. Instead of holding the rod by the handle, they hook three fingers underneath the seat of the rod. The palm of the hand fits over the reel, and the thumb and the index finger lightly hold the line just in front of the reel.

Holding the line in this manner keeps proper tension on the line as it is reeled onto the spool. This enables the line to be wound evenly and tightly onto the spool. Tangles can occur only when line is wound onto the spool without being under proper tension.

The Spinning Reel

The spinning reel was commercially introduced to the United States by a French company in the mid-1930s. Just as the reel was becoming accepted by American anglers, World War II began. When France was occupied early in the war, the supply of spinning reels was cut off. After the war, the spinning reel began to capture its share of the American fishing tackle market. Today, spin fishing is an established sport in America.

A spinning reel has features and benefits that distinguish it from other reels. First, this reel is mounted under the rod, making it easier to handle the coils of line that come off the reel spool during the cast. Gravity pulls the loops of line down and away from the rod. If the reel were mounted on top of the rod, the line would fall onto the rod and would become tangled before it reached the first guide.

Another distinguishing characteristic is that the spinning reel was first designed to be reeled with the left hand. Many manufacturers still produce a left-handed reel as the standard model. Most manufacturers, especially those in America, now produce right-handed reels. It may be awkward for the first few retrieves, but the left-handed reel is easily adapted to with a little practice. Casting with the right hand and reeling with the left hand becomes a natural thing and wastes little motion.

A third characteristic and a real advantage is that the spinning reel makes it possible to cast the lightest possible lures, since there is little friction on the line as it leaves the reel.

Figure 5.5 identifies the major parts of a spinning reel. Refer back to it as you read about each feature.

The Spool

The spinning reel spool is considered to be stationary. This means that it does not revolve like the spool of the bait-casting reel. One end of the spool faces the angler, and the other end faces the front of the reel. The front end of the spool stands free and is connected only to the drag adjustment and spool release mechanism.

As the cast is made, the weight of the lure pulls line off the front end of the spool in coils. Since the only friction on the line is caused by the line sliding over the lip of the spool, it is possible to cast very light lures. It is also possible to make very long casts with heavier lures.

A full spool makes longer and smoother casts possible. The line leaves the spool in large coils, barely touching the lip of the spool. As the amount of line on the spool decreases, the coils become smaller and are more likely to hit the lip of the spool. For this reason, the spool should be kept full of line. Some suggest filling the spool to within 1/16 inch of the lip of the spool.

The spool rests on a metal shaft or spindle and moves in a forward and backward motion, so that the line is wound evenly onto the spool. This is a key feature of a spinning reel, since it

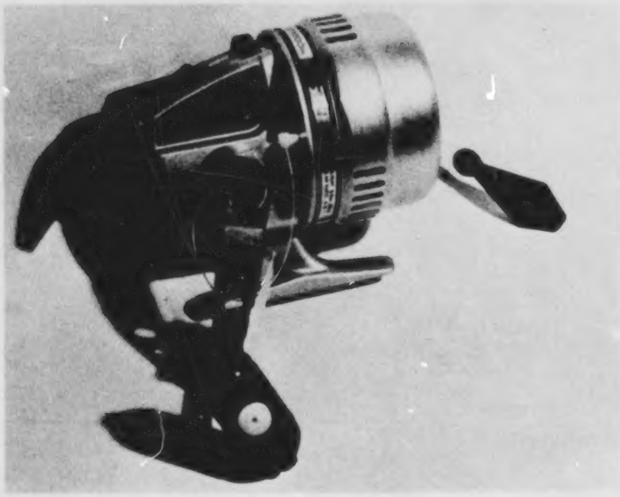


Fig. 5.4. *Spin-casting Reel*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

does not have a level wind mechanism like that of a bait-casting reel.

The Line Pickup

A spinning reel will have one of three line pickup systems. The most popular is the *bail pickup system.* A bail is a heavy piece of polished wire that attaches to both sides of the reel. It is not stationary, but is hinged at each connection point. On one end of the bail is a part called a roller. The line passes over the roller as it is rewound onto the reel. On most reels, the roller is a solid piece of polished metal, not a moving part.

When casting, the bail is pushed down, which releases the line from the roller and moves all obstructions from the front of the reel. The cast is then made. As soon as the reel handle is turned, the bail snaps back into place and, in this position, it touches the line. As the reel handle is turned, the bail revolves and causes the line to slide down to the roller. As the rotating head or winding cup turns around, the line is wound onto the spool. The spool moves forward and backward, so the line is not wound onto one part of the spool.

The second type of line pickup system is the *manual pickup system.* This reel does not have a bail, but a roller is attached to the rotating head. The angler uses a finger to quickly flip the line off the roller when preparing for a cast. After the cast, the line is again looped over the roller with a finger. The roller holds the line in position while the rotating head turns, and the line is wound onto the spool. This pickup system is simple and has a minimum of working parts. It is quickly learned and many anglers prefer it, since little can happen to keep it from working.

The *automatic line pickup system* is not as popular now as in the past. With this system, the pickup is a small curved area that contacts the line and spools the line onto the reel as the handles are turned (see fig. 5.6).

The Drag

The drag on most spinning reels is found at the front of the spool. The spool fits over a metal shaft called a *spindle.* Next to the spool are pressure disks (the drag) that can be turned to exert more or less pressure on the spool. The object is to set the drag at a point where the fish will strip line from the reel before the line will break. If a fish does overcome the drag, the spool turns to release the line, while the bail and the rotating head usually stay in a stationary position. This is the only time that the spool actually turns.

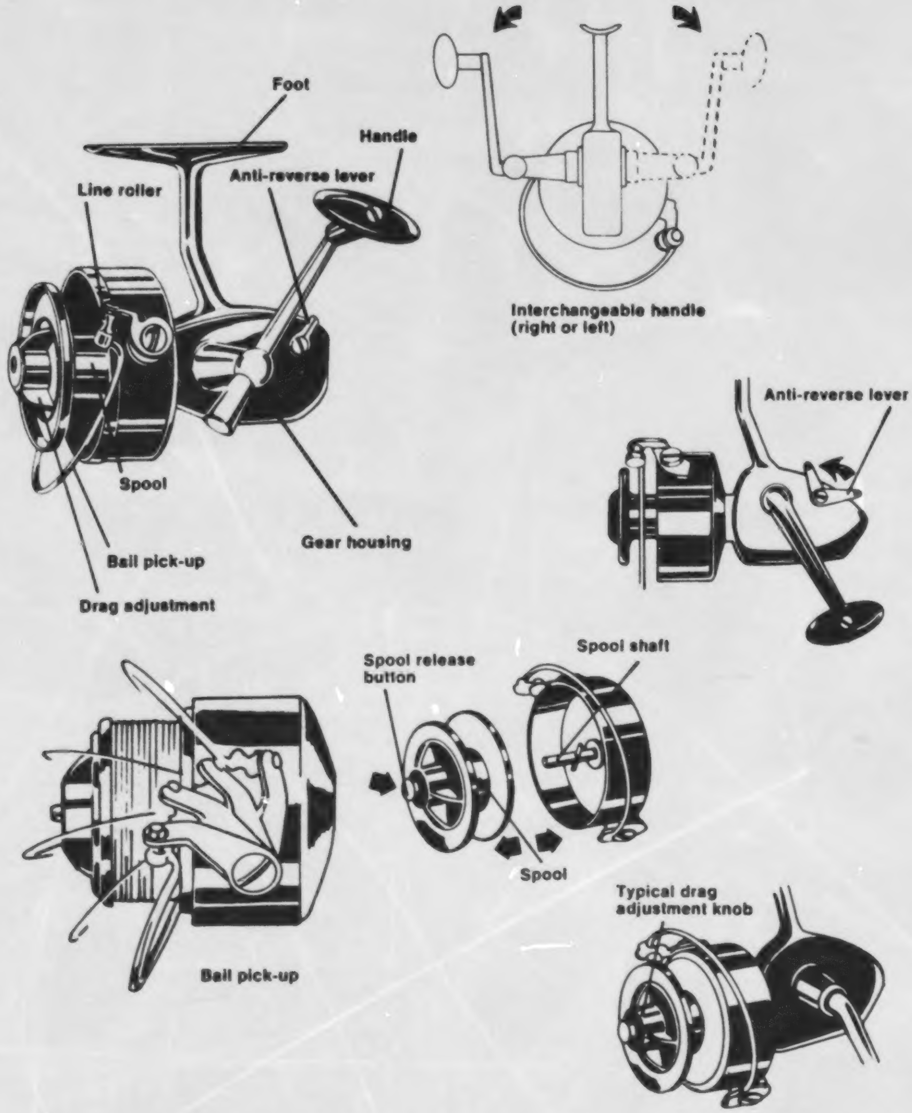

Foot
Handle
Line roller
Anti-reverse lever
Spool
Gear housing
Bail pick-up
Drag adjustment
Interchangeable handle (right or left)
Anti-reverse lever
Spool release button
Spool shaft
Spool
Typical drag adjustment knob
Bail pick-up

Fig. 5.5. *Parts of a Spinning Reel (Courtesy AFTMA)*

The Rotating Head

This device actually turns when line is being retrieved. The bail and the line roller are attached to the rotating head and assist in winding the line onto the spool.

The Antireverse Lever

This device keeps the reel handles from turning backward, which prevents line from leaving the reel except when taken out against the drag. The antireverse lever is a useful feature when trolling or still fishing.

The Fly Reel

The function of a fly reel differs from other fishing reels. Bait-casting, spin-casting, and spinning reels play a big part in casting a lure. A fly reel is used mainly to store line, and the rod and line work together to cast the fly.

Some experts have said that, if a choice must be made, the angler should buy the best fly rod and economize on the fly reel. This is not to say that a fly reel is unimportant, but it is not as critical to fly fishing as are the rod and line.

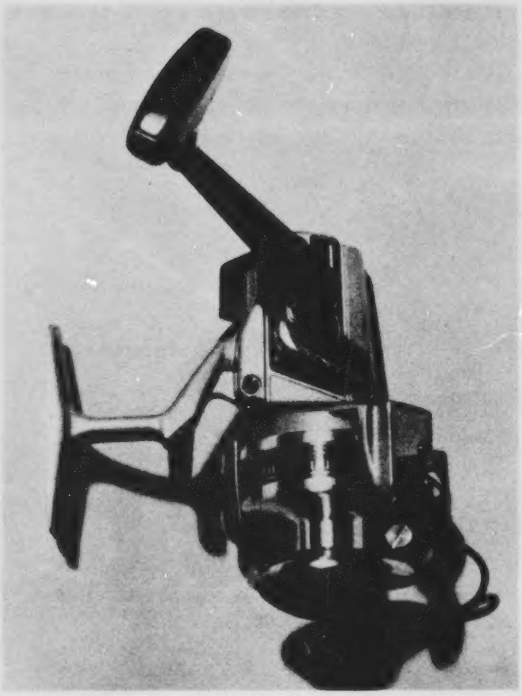


Fig. 5.6. Spinning Reel
(Courtesy Oshman's Sporting Goods, Austin, Texas)

There are two types of fly reels—the single-action fly reel and the automatic fly reel.

The Single-Action Fly Reel

A single-action fly reel is relatively simple, with few parts and very few moving parts (see fig. 5.7). It consists of a spool surrounded by a frame attached to the reel foot. A small handle is attached to the spool. Some reels have a line-stripping guide, a metal ring through which the line passes as it leaves the reel. On many of these reels, there are no compounded gears, and the spool turns once for each time the handle is turned. In fact, the handle is usually connected directly to the spool.

As the cast begins, the angler strips line off the reel. When the retrieve is begun, the angler may turn the reel handle to take up line. This is often the case if the angler is fishing in salt water or anticipates a strike by a heavy fish.

Those who fish for smaller trout and panfish usually take in the line by hand, and wind it onto the reel after the retrieve has been completed. If the angler is making short casts, the new cast may be made with line that is already stripped from the reel. If this is the case, the line may not be wound onto the reel until after several casts and retrieves have been completed.

A good single-action reel will have an adjustable drag. The cheaper models will have at least a brake with a click. The drag should be used to prevent the spool from overspinning when line is stripped from the reel.

Another desirable feature is interchangeable spools. The reel should allow spools of line to be changed with little difficulty. If a line becomes soaked, it can be replaced with a fresh spool of line.

Do not let your customer make the mistake of assuming that a single-action fly reel is inferior. "Automatic" is not necessarily better. Many single-action reels are of high quality and

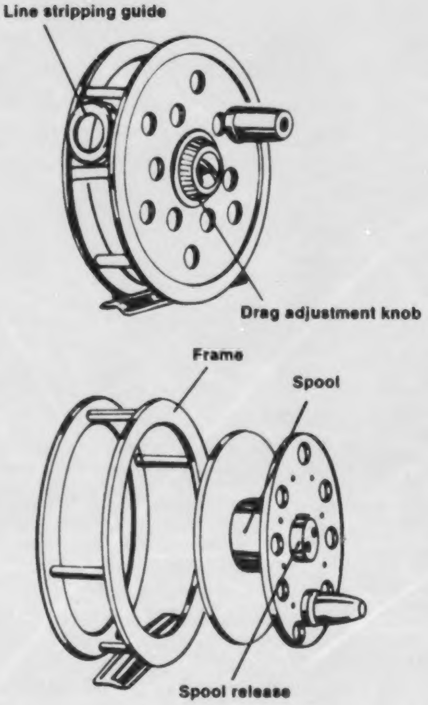


Fig. 5.7. Parts of a Single-action Fly Reel
(Courtesy AFTMA)

should be represented as such (see fig. 5.8). For some anglers, an automatic reel is a "contraption" that takes away from the art of fly fishing. For most anglers, reel selection is mainly a matter of personal preference.

The Automatic Fly Reel

Automatic fly reels (fig. 5.9) automatically retrieve the line when a special lever is pressed. As line is stripped from the spool, the spool turns and winds a spring that is located inside the reel. Later, when the lever is pressed, the spool should turn in the other direction and take up about the same amount of line that was stripped from the reel. Its main purpose is to quickly pick up excess line while the angler is playing a fish. This may prevent the loss of a fish making a strong run.

Anglers using the automatic fly reel must learn not to accidentally touch the return lever while working a fly. This is easy to do, and it causes the fly to lose its natural appearance as it suddenly jumps through the water. Some fly reels have a safety lock or a folding trigger to prevent an accident.

Most automatic fly reels have a stripping guide, a large opening with a polished metal surface. Line can run across this surface with little threat of abrasion (see fig. 5.10).

One point to remember when selling fly fishing equipment is that the reel should complement the rod. An automatic reel looks

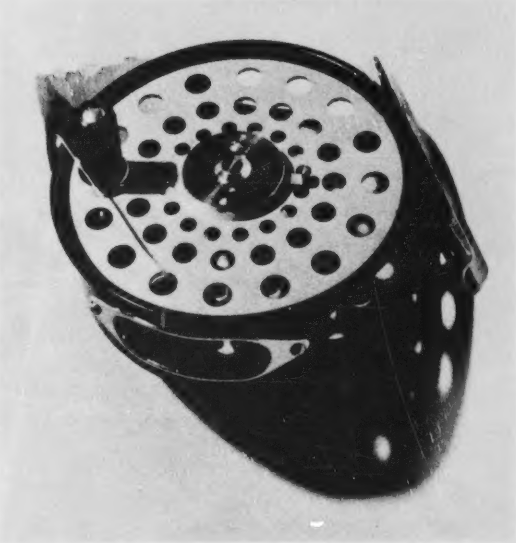


Fig. 5.8. Single-action Fly Reel with Manual Retrieve (Courtesy Oshman's Sporting Goods, Austin, Texas)

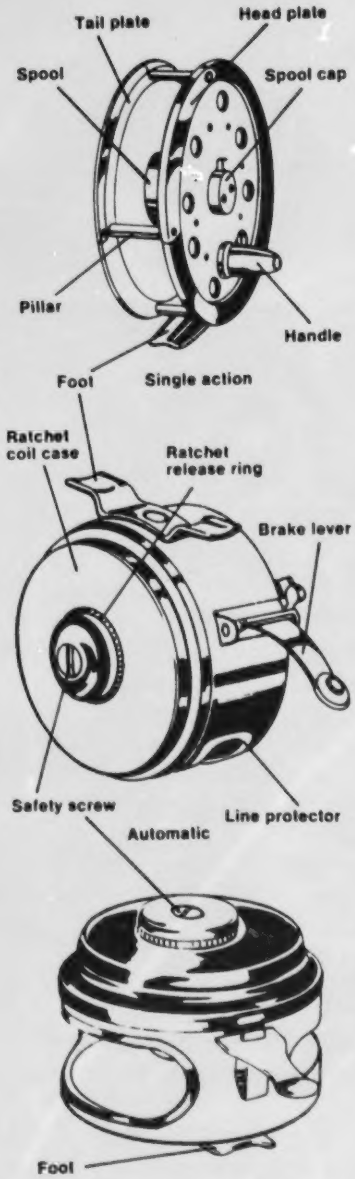

Tail plate
Head plate
Spool
Spool cap
Pillar
Handle
Foot
Single action
Ratchet coil case
Ratchet release ring
Brake lever
Safety screw
Line protector
Automatic
Foot

Fig. 5.9. Parts of an Automatic Fly Reel (Courtesy AFTMA)

all right with a bass bug-action rod, which is large enough to handle the weight of the reel. The same reel would be out of place on a very light rod used for small trout in small mountain streams.

Saltwater Reels

Saltwater reels include spinning reels, bait-casting reels, and large, big game reels. Reels designed for saltwater use are constructed of corrosion-resistant materials. Some high-quality freshwater reels can be used for light saltwater fishing. Reels used in salt water ordinarily should have a greater line capacity than the average freshwater reel. This is necessary for handling the long runs that occur when a good saltwater game fish takes a lure or bait.

Most of the lighter saltwater bait-casting reels have a level wind mechanism (see fig. 5.11). The larger reels usually lack this feature, and the line must be moved by the angler as it is wound onto the spool.

Big game reels are very large and are built to handle extreme pressure. A 500-pound mako shark can put a great deal of stress on a reel, and a poorly constructed reel could fly apart under the pressure of such a fight. Most heavy-duty reels have harness lugs that enable the angler to snap the reel to the fighting harness. This is a specialized type of fishing, and the tackle salesperson can best learn about this equipment by studying literature from the manufacturer and talking to experienced tackle salespeople.

Fig. 5.10. Automatic Fly Reel (Courtesy Oshman's Sporting Goods, Austin, Texas)

Care of Fishing Reels

As a tackle salesperson, you should provide the customer with some information on how to care for a reel once it is purchased. Show the customer the oiling points on the reel and the type of oil to use. It's also important to show the customer how to expose the inner workings of the reel and how to lubricate these parts with the appropriate lubricant. Explain the importance of removing grime and water from the reel before storing it for any length of time.

Finally, show the customer how the reel can be disassembled for thorough cleaning. You may not have time to actually demonstrate how to disassemble the reel, but you should show the customer literature that illustrates an exploded view of the reel. This will be of assistance as the customer attempts to disassemble the reel. If the reel is to be used in salt water, explain the importance of thoroughly cleaning the reel after exposure to salt water. In any case, the reel should be flushed with fresh water after use in salt water.

Questions

1. Name one major difference between early and modern reels.
2. As a tackle salesperson, what kinds of product knowledge should you have concerning fishing reels?
3. For what purpose were the earliest bait-casting reels built?
4. Define the term *backlash.*
5. State the purpose of the *spool* of a reel.
6. What is a "free spool" on a reel?
7. What is a *drag* on a fishing reel?

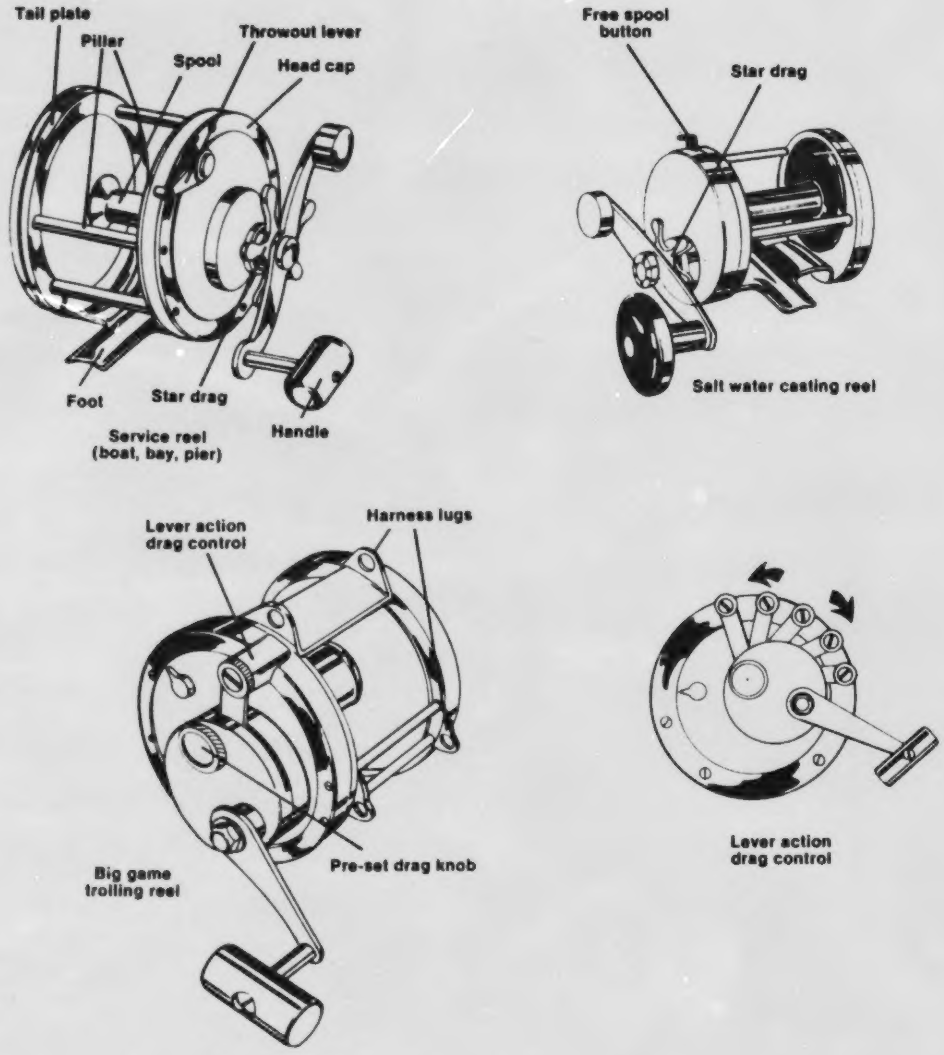

Tail plate
Pillar
Throwout lever
Spool
Head cap
Foot
Star drag
Handle
Service reel (boat, bay, pier)
Free spool button
Star drag
Salt water casting reel
Lever action drag control
Harness lugs
Big game trolling reel
Pre-set drag knob
Lever action drag control

Fig. 5.11. *Saltwater Bait-casting Reel (Courtesy AFTMA)*

8. Does the spool on a spin-casting reel revolve or is it stationary?

9. State the function of the nose cone of a spin-casting reel.

10. Are most *spin-casting reels* designed for use with bait-casting or spinning rods?

11. Who first commercially introduced spinning reels to the United States?

12. Tell why the spinning reel is mounted under the rod.

13. Why should the spool of a spinning reel be kept full of line?

14. How many line pickup systems are used in spinning reels?

15. Cite the main function of a *fly reel.*

16. Name the two types of fly reels.

17. Do all saltwater reels have *level wind mechanisms?*

Projects

1. Develop a poster of reels stocked by your training station. Classify the reels according to type. Under each reel, list what you consider to be its five strongest selling points.

2. Select a reel from your training station. With your employer's permission, take the reel apart and then reassemble it.

3. Contact members of a local fishing club. Ask several to identify their favorite reel and to give reasons why they like it best.

6

Fishing Lines

***Objectives:** After completing this assignment, you will be able to—*

1. *cite two disadvantages of early fishing lines made from natural fiber;*
2. *name the materials produced in World War II that are now used in fishing lines;*
3. *tell how fly lines were greatly improved in the 1950s;*
4. *tell what "softness" and "stretch" mean in relation to fishing lines;*
5. *state what the "line test" of a fishing line means;*
6. *tell what the term "class line" means;*
7. *state which type of fishing line is used more widely than any other;*
8. *cite the appropriate conditions for storing fishing lines;*
9. *list the three types of wire line used by anglers in the United States;*
10. *tell what the label indicates on most fly rods; and*
11. *cite the use of a "shock leader" in fishing.*

How would you answer a customer who asked the following questions?

- What is a double-taper fly line?
- Why is silk line not used as much now as in the early 1900s?
- What is 15-pound test line?
- Are the weight test and the weight class of a line the same thing?

Unless you have been doing your homework on fishing lines, it's likely that you cannot answer all of the questions above. As a tackle salesperson, you'll find that there is a lot to learn about fishing lines. Many of your customers will be buying new line to replace old line. They will often ask about the right line for certain fish, about colors of line, and so on. You will also sell a lot of line to customers who buy fishing reels. In fact, you should always suggest that the customer buy line when you sell a reel. For these sales, you will need accurate information about which lines to suggest for use with the reels purchased by your customers.

This assignment will provide information that you can use in deciding which line to recommend to each customer. It includes a review of the history of fishing line, the characteristics and construction of fishing line, types of line, and leaders used with fishing lines.

History of Fishing Lines

If you had been the first person to try to catch a fish with a line and hook, what would you have used as a line? Perhaps the very earliest anglers used vines or a line braided from some plant fiber. The earliest lines on historical record were made from horsehair. Hairs from the tail of a horse were woven or braided. And since these woven hairs were not as long as the line needed to be, several pieces were tied together.

McClane's Standard Fishing Encyclopedia and International Angling Guide (1965) printed a passage from *Fishing in American Waters,* a book printed in 1869. The writer was describing the equipment needed for a fishing trip. He suggested two horsehair lines, from 80 to 100 feet long. The lines were braided in the form of a whiplash and were nearly ¼ inch in diameter at the center. The strength of the horsehair line was determined by the number of strands of hair used in making the line.

Later, linen and silk braided lines were developed and used up until World War II. Usually, these lines were handmade. Linen lines were made by first twisting the small fibers in one direction. These twisted lines were then wound together in the opposite direction.

Any tendency for the line to untwist would result in a reverse twist in the smaller fibers, causing the line to tighten and to resist any untwisting motion. Silk fibers were usually braided by machine. Cotton and enameled cotton lines were also used to some extent.

Today, an angler can fish with a monofilament line all day with little trouble. This was not the case with lines made from natural fibers. The natural fiber lines became soaked, causing the line to become heavy. Often the angler was sprayed as the line passed through the guides on the rod. Another disadvantage of natural fiber lines is that they mildew and rot very easily.

They had to be strung out and wiped dry after every outing. To leave one of the natural fiber lines wound on the reel after a day of fishing would almost guarantee that the line would be ruined for the next fishing trip. During the off-season, the line had to be carefully stored if the angler expected to use it during the next fishing season.

Piano wires were first used as a fishing line in the late 1800s. This was the forerunner of the solid wire, braided wire, and lead core wire lines sold in tackle shops today.

During World War II, many synthetic products were introduced to the American consumer. Nylon is one of the most important synthetic fibers to be developed during the war effort. It is used in many products and industries, and it certainly is one of the most important discoveries for the fishing tackle industry.

The manufacture of fly lines took a giant step in the 1950s. Until then, a fly line had been hollow, so it would float. The angler had to rub a dressing on the line periodically during a day of fishing, so the line would not become waterlogged. In the 1950s, manufacturers discovered how to cover the core of braided line with a plastic coating. This greatly reduced the angler's problems in caring for fly lines.

Today's fishing lines include monofilament, braided nylon, braided Dacron, nylon squidding line, various types of wire line, and floating and sinking fly lines. Monofilament line is now the most widely used of all lines. Manufacturers have done much research on developing stronger lines with a smaller diameter. They have also done a good job of developing lines with greater flexibility or limpness.

Early monofilament was fairly stiff, but new monofilament lines are almost as limp as many of the natural fiber lines. Early monofilament line was clear and had no color. Many line manufacturers today are producing lines in various colors. Some are designed to be easily seen by the angler but are almost invisible under the water.

Fishing lines today are greatly improved over the horsehair lines used during the 1800s. It will be interesting to see what the future will bring. The entire fishing tackle industry is very competitive. New products are continually being introduced to give manufacturers an advantage over their competition. This is true of line manufacturers as well as those who manufacture rods, reels, and lures. As a fishing tackle salesperson, you will want to keep up with new developments in fishing line production.

Fishing Line Characteristics

Fishing line has several important characteristics for anglers. One line may be strong in one area and weak in another. This section introduces you to some of the major characteristics of fishing line.

Softness

This refers to the relative *limpness* of the line. Some lines are stiff and are difficult to handle. Most braided lines are fairly soft. Monofilament may be rather stiff, if it is a less expensive line. The better monofilament lines are much softer now than they were a few years ago. Wire line is also stiff in comparison with most braided lines, but is still softer than most people might think if they have never used it.

Stretch

This term is used to describe how much longer the line will become when it is pulled taut by the angler. This is a very important line characteristic, especially if the angler is fishing with a lot of line in the water. If a line has too much stretch during a strike, the hook may not be driven into the fish's mouth. If an angler has a lot of line out, it usually forms into a curved or "belly" shape. The strike's motion must take up the slack and stretch of the line, if the hook is to sink into the fish.

Too little stretch may allow a fish to break the line, if it makes a sudden run. If the drag on the reel is set too tightly or if the angler has the line snubbed up tightly, the sudden strain on the line may cause it to snap. The same thing might happen if the lure suddenly catches on a rock or other underwater obstruction. For this reason, most line manufacturers build some "stretch" into the fishing line they produce and sell.

Monofilament lines tend to have more stretch than most other fishing lines. Braided nylon lines also have a considerable stretch in comparison to other lines. Braided Dacron and the various wire lines usually have only a slight degree of stretch.

Knot Strength

This refers to the action of the line when tied into various types of knots. Monofilament line, for example, holds up or will not break when tied into most knots. To tie a "granny knot" with monofilament line, however, will almost guarantee a line break as soon as pressure is applied to the knot. The knot strength of a line will sometimes differ from one type of knot to another.

Some very soft lines are slippery and may be hard to tie into a knot. Slippage will sometimes happen with very light monofilament line, if the knot is tied too close to the end of the line.

Abrasion Resistance

It is difficult to keep your line from rubbing against rocks, brush, pilings, or the boat from which you are fishing. Every time you cast, your line rubs against each of the guides on your rod. How well the line resists breaking after rubbing against a rough surface is a measure of its abrasion resistance.

Every line is weakened when it is knicked or when its surface is roughed up in some way. Some lines will last longer than others while receiving rough treatment. It is important that the line always be as strong as its classification indicates. One never knows when a trophy fish will strike.

One point that the angler needs to remember is that, even with a smooth tip top guide on the rod, the pressure of the line against the guide during the cast may cause abrasion. With each cast, the weight of the lure forces the line against the guide. This pressure is very great during the cast, and abrasions usually will occur. It is a good idea to clip off about 2 feet of line for every hour of continuous casting.

Line Test

Most spools of fishing line are rated according to *line test*. This means that a wet line will not break at a point below the line test rating. If a line has a test rating of 17 pounds, that line is not supposed to break if less than 17 pounds of weight is placed on the line.

The line test has nothing to do with the maximum amount of weight the line will handle. It's unlikely, but a 17-pound test line may even handle 70 pounds of weight. The line test only states the point below which the line is not supposed to break.

Class Line

Class line approaches weight from a different angle than line test. The International Game Fish Association creates categories for the purpose of measuring world records in fishing. For each species of fish, a record may be designated for various classes of line. A world-record sailfish may be designated for the 20-pound class line or for the 50-pound class line. If an angler catches a large sailfish on 20-pound class line, the line must be tested before the fish can be considered for the 20-pound class record. A piece of the line must be submitted for testing. If the line does not break before 20 pounds of pressure have been applied, the fish will not be considered for the 20-pound class record.

Class line is guaranteed by the manufacturer to break as near as possible to the stated class line strength, but not at or above that point. Class line is manufactured with a great deal of care. Only the highest-quality line will maintain its class strength throughout its full length. An angler that has invested several hundred or several thousand dollars in an attempt to catch a record fish must be able to depend on the line being used.

Fibers Used in Fishing Lines

Several types of lines and their characteristics have been described. This section presents information about several of the lines that may be found in tackle shops today.

Dacron

Dacron is a Du Pont Company trademark for a synthetic polyester fiber made from chemical compounds derived from coal, air, water, and petroleum. Dacron is produced or spun into a single strand. Most Dacron fishing line is produced in a braided form. Several of the single strands of Dacron are braided into a line, which may be coated to improve its quality.

Dacron line is dense and will sink below the surface of the water. It is strong, like nylon, but it does not stretch as much. While nylon may stretch as much as 17 to 30 percent before breaking, Dacron will stretch only about 10 percent. Most of the stretch occurs during the heavy-stretch phase, when a great deal of pull is placed on the line.

Some lines have a different strength when dry than when wet. The wet strength of Dacron is about the same as its dry strength. Some synthetic fibers quickly deteriorate when exposed to sunlight; however, Dacron is not greatly affected by sunlight. It also has good resistance to mildew and does not rot as easily as lines made from natural fibers.

Dacron line is used mostly on freshwater and saltwater casting reels, as well as on those used for trolling, saltwater boat fishing, and saltwater big game fishing.

The knots used on Dacron line must be carefully selected, so the line will maintain good knot strength. Some manufacturers recommend that Dacron line be spliced and even include splicing needles with large spools of Dacron line.

Nylon

Nylon is another synthetic fiber. Like Dacron, it is produced as a continuous filament. The resins used in making nylon are forced through small holes in a metal plate while under high pressure. The fiber is usually stretched during the manufacturing process. Nylon is very strong, having a tensile strength of 70,000 to 100,000 pounds per square inch of cross section. This is about the same strength as mild steel. Nylon fibers are almost waterproof and absorb very little water. The wet strength of the fiber is not usually over 10 percent of its dry strength.

Braided Nylon. Braided nylon is much like braided Dacron in appearance, but it tends to be somewhat softer than Dacron. Hard braided nylon is longer wearing than soft braided nylon, but it does not spool onto a reel as well. Soft braided nylon line is thought to contribute to casting accuracy and is often preferred by those who compete in casting tournaments.

Nylon Monofilament. This line is used more widely than any other type of fishing line. It is almost required for spinning and spin-casting fishing and is used almost exclusively in free-spool casting reels. It is a single, unbraided strand that has been forced through a hole in a steel plate during the manufacturing process.

Since they are usually as good as the manufacturer who produces them, there are vast differences in quality of nylon monofilament lines. Monofilament line can be tied into a large number of knots without seriously weakening it. Line stretch is a factor the angler must consider when using a monofilament line. It is important to keep the line fairly taut and not to allow it to "belly" out so that a great deal of slack line must be taken up during a strike.

Good nylon monofilament will withstand rough treatment, but it is not 100 percent abrasion-resistant. If the line is rubbed against a rough surface, it may be nicked and weakened. The last few feet of line spooled onto the reel should be checked periodically to reduce the chances of a line break when a heavy fish is hooked.

Manufacturers today are doing a good job of developing lines that are very strong in relation to their diameters. Most anglers recognize the practical importance of using the smallest possible line in order to produce the most strikes. The smaller diameter enables the line to sink faster and to be less visible to the fish. Smaller, lighter, and softer lines also are less likely to interfere with a lure's action.

Nylon monofilament will deteriorate if left in the sunlight over a period of time. A tackle salesperson should store line in a cool, dark location in order to lengthen its shelf life.

This line is almost always sold by the spool. Most packages contain two connected spools, and each spool may hold from 50 to 100 yards of line, depending on the line's diameter. Some tackle shops have large spools of line and sell it by the foot or fill a customer's reel for a standard fee. This is usually a good arrangement for the customer and the tackle shop.

It is not usually necessary to use a leader to fool the fish with a monofilament line, since the line is almost invisible. Leaders are sometimes used when angling for sharp-toothed fish or fish with sharp gill covers. The leader is usually a nylon monofilament line, much larger than the line spooled onto the reel. The larger line will not break or be cut as easily as the regular line.

Linen

Linen line was popular among saltwater anglers until the mid-1950s. Since that time, braided Dacron and nylon monofilament lines have replaced most linen lines. Linen was popular because it did not have much stretch, and it was not easily broken as a result of contact with rocks, pilings, and other water hazards.

Linen line consists of threads that are twisted or braided into a single line. The line is referred to in units of thread count, based upon multiples of three. It ranges from 6-thread lines to 72-thread lines. The pound test range is from 18 pounds test for the 6-thread line to 216 pounds test for the 72-thread line.

Silk

Silk line may be found in some tackle shops today, but it has been replaced largely by lines made from synthetic fibers. Silk line was widely used during the first half of this century. Like most other natural fiber lines, it absorbed water and would become difficult to handle. Silk was also subject to mildew and rot. Because of the many advantages of lines made from synthetic fibers, most anglers have quit using silk line.

Wire

Wire line is found in three forms—solid wire, braided wire, and lead core lines. The wire used in most lines is stainless steel or Monel, a nickel alloy. Some earlier lines were made of copper. Wire line is used for trolling in waters where the fish are likely to be found at greater-than-average depths. It is especially popular in saltwater and Great Lakes fishing.

Most wire lines fall into the 15-to-45-pound test range but may range from 8-pound to 250-pound test. Since wire is harder to handle than other lines, most anglers use narrow-spooled reels when using wire line. The narrow spool is less likely to cause tangles in the wire than would be the case with a wide-spooled reel.

Wire line is usually backed with some type of braided line, like Dacron. Some anglers recommend filling the spool two-thirds full of Dacron line and then adding up to 300 feet of solid Monel wire line. Experience is a big factor in deciding how much line to let out. The speed of the boat, the lure, and the type of wire line used will greatly affect how deep the line will sink. The angler should mark the line every 50 feet, so it is easier to guess the running depth of the lure.

Solid wire line is a single strand that will sink faster than braided or lead core lines. Braided wire line consists of three to seven strands of twisted wire. It is more flexible and resists kinks better than solid wire line. Braided line will not sink as fast as solid wire line, however. Lead core line consists of a lead wire covered with a braided covering, like Dacron. All lead core lines have about the same size lead core.

The strength of the line depends on the braided covering. A thicker covering makes a stronger line. This also means that stronger lines are bulkier and do not sink as quickly as a lead core line with a lower pound test rating.

As you can see, fishing with wire lines is not as easy for a beginner as fishing with Dacron or nylon lines. Many factors must be considered in choosing and using a wire line. If your tackle shop is located in an area where wire line is used a great deal, you should try to talk to experienced wire line anglers. These people will be able to provide you with useful information that will help your customers select the right line.

Lines Used with Various Types of Fishing Tackle

Lines Used with Bait-casting Tackle

Most of the better bait-casting reels now have a free-spool feature. Monofilament line is used on practically all of these reels. Braided Dacron and nylon lines were widely used until free-spool reels became popular. However, braided casting lines are still manufactured and sold in tackle shops today. Some anglers still prefer the Dacron line because of its resistance to stretching.

Bait-casting lines come in many different pound test classifications. Few bait casters use lines with less than a 6-pound test rating. For many, the lowest range would be no less than 8- to 10-pound test line. Those wishing to use a lighter line would probably trade the bait-casting equipment for spin-casting or spinning tackle. The upper-pound test range for most freshwater bait casters is 30- to 35-pound test line.

Most serious bass anglers use line in the 15- to 20-pound test range. In recent years, many of these anglers have started using line in the 10- to 14-pound test range in order to improve the chances of getting strikes. Anglers buying the narrow-spooled reels often stock them with these lighter lines.

Lines Used with Spinning Tackle

For several years, monofilament line has been used almost exclusively with spin-casting and spinning tackle. This line is slick and winds off the spool and through the guides more easily when a light lure is used. Braided line tends to have more surface tension and does not wind off the reel as smoothly as monofilament.

The pound test rating of a monofilament line depends largely on the equipment used. Ultralight spinning equipment is often rigged with a 2-pound test line, and it is possible to find even smaller line. An angler using a medium-heavy spinning rig for bay and channel fishing might use a monofilament line with an 18-pound test rating. As you can see, the line should always match the equipment and the fish an angler hopes to catch.

Lines Used with Fly Fishing Tackle

This is a more complicated area that all tackle salespeople should learn. The secret to all fishing is to have a *balanced rig*. This means that the rod, reel, and line all work together smoothly. A balanced rig makes fishing a pleasurable activity, but a rig consisting of mismatched equipment can cause the best angler to have a bad day.

It's probably more important in fly fishing tackle to have a well-matched rod, reel, and line than in bait-casting or spinning tackle. Also, matching the line to the rod is more critical in fly fishing than matching the reel to the rod. For this reason, we will spend some time discussing fly lines.

Most new fly rods have a number imprinted on the rod or the label that tells the angler which line to buy. Line manufacturers that are members of the American Fishing Tackle Manufacturers Association have adopted a uniform numbering system from one company to another.

The number of the line indicates the weight of the first 30 feet of the line, not counting the tapered tip. A number 3 line weighs 100 grains. A number 12 line weighs 380 grains. The weight from one number to another does not increase at an even rate. Figure 6.1 will tell you more about line weight. Since the fly is cast by the weight of the line, and not the lure, it is important that the right line be used. A line that is too light for the rod will not bend the rod enough during the back cast for it to snap back with the power needed to propel the line far enough forward for a good cast. If the line is too heavy, it will cause the rod to bend, but the rod cannot cast it any great distance.

Most fly lines will also have letters placed in front of the line's number. These letters indicate the kind of *taper* that has been built into the line. "Taper" means that the line is thicker in some parts than in others. A taper at the end of a fly line makes it possible to make a very

Fig. 6.1
AMERICAN FISHING TACKLE MANUFACTURERS FLY LINE STANDARDS
(Weight in grains based on the first 30 feet of the line, exclusive of tapered tip. The range is that of acceptable manufacturing tolerances.)

Number	Weight	Range
3	100	94-106
4	120	114-126
5	140	134-146
6	160	152-168
7	185	177-193
8	210	202-218
9	240	230-250
10	280	270-290
11	330	318-342
12	380	368-392

(Courtesy *Fly Casting*, by Jim Green, a Fenwick Publication)

delicate presentation of the fly. The line is thinner at the tip, so it does not disturb the water as much. A weight-forward taper means that the line is thicker at the front, which helps the angler make longer casts.

Most fly lines are braided and coated with plastic. The plastic coating can be regulated so that it is thicker or thinner, as the manufacturer designates. If a double-taper line is desired, the plastic is made thicker in the middle of the line. If a weight-forward line is desired, the plastic is made thicker at the front of the line.

A level line is easiest to make and has an even coating of plastic throughout its length. The letter *L* means that the line is level, *DT* means that the line has a double-taper, and *WF* stands for weight forward. A sinking line will have the letter *S* before the number. A designation of *F/S* means that the main part of the line floats, but the tip of the line will sink. The *S* and *F/S* designations refer to the density of the line.

Most fly reels have Dacron backing under the fly line. As a tackle salesperson, be sure to recommend this backing, as well as a fly line, to anyone who buys a fly reel.

You have been introduced to the basics of fly line construction and classifications. There is much more to learn about fast-sinking lines and other special features that your customers may prefer. If you have never done any fly fishing, talk to customers who buy this equipment. Customers can often provide very useful product information that can supplement what you learn from bulletins and brochures from the various manufacturers.

Lines Used with Saltwater Tackle

Saltwater fishing is a broad category that encompasses several types of fishing. These are surf fishing, party boat fishing, channel and bay fishing, and big game fishing.

As discussed earlier, almost all spinning tackle, including saltwater spinning gear, is fitted with a monofilament line. The weight of the line must be matched with the rod and the fish that the angler desires to catch.

Linen lines were once favored for surf fishing but have been replaced by braided nylon and braided Dacron lines. Dacron is favored by some, since it sinks rapidly and has little stretch. Nylon line is "cooler" when the angler must thumb the spool, since it absorbs some water. A 36-pound test braided line is considered best by many anglers, although lighter and heavier line may be used.

In big game fishing, anglers usually troll with a large bait. The size of line used will depend mainly on the type of fish sought. The 130-pound test line is often used for heavy big game fish, and smaller line is used for smaller species of fish. Many charter boats use a 50-pound test line when inexperienced anglers are aboard.

Wire line is sometimes used for deep-water trolling. Some anglers use a wire line while drift fishing for saltwater species like bluefish.

Leaders

A leader serves two basic purposes. One is to provide a more invisible connection between the line and the lure, especially important when fly fishing. The second purpose is to prevent fish from biting through the line or from fraying the line with their sharp scales or gill covers. In some instances, a leader may be used to keep the line from twisting, which is often the case when trolling with a spoon. Figure 6.2 shows different types of leaders.

Leaders and Fly Fishing

In fly fishing, the leader's main purpose is to provide an invisible connection between the line and the fly. A fly line is very heavy and is easily visible to a fish. The leader, usually made of nylon monofilament, is almost invisible. The leader is larger where it connects to the line and then tapers down to a desired thickness.

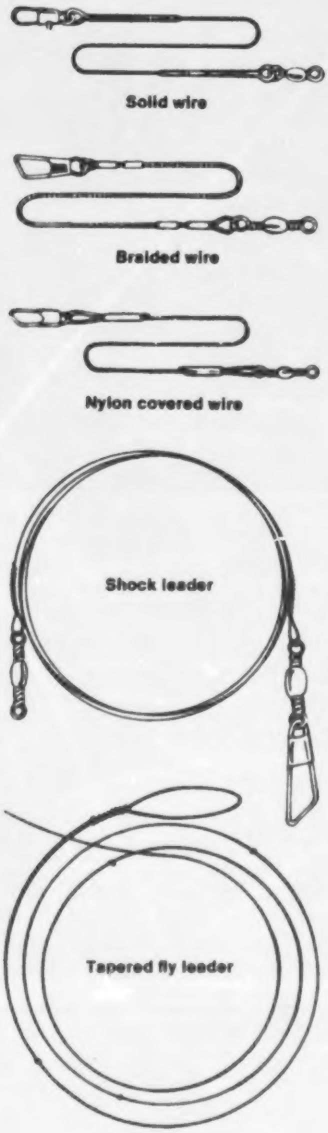


Fig. 6.2. Different Types of Leaders (Courtesy AFTMA)

It is estimated that the leader needs to be at least 75 percent of the thickness of the line at the point where the line and leader are connected. A thinner leader might not straighten out properly and let the fly drop the correct distance from the line.

The *tippet* is the end of the leader that is tied to the fly. Figure 6.3 is a chart of the size categories, pounds test, and diameter of various leaders. It also indicates the size of leader that should be used with different sizes of flies.

Leaders in Bait Casting and Spinning

Most freshwater fish are not likely to bite or cut a fishing line. For this reason, anglers fishing with monofilament line normally do not use a leader. If a braided line is used, a short monofilament leader can "hide" the connection between the line and the lure. If the angler is fishing for northern pike, walleye, or muskellunge, it may be wise to use a wire leader.

Anglers are divided on this point, and some use a leader while others do not. If the angler is using bait instead of a lure, it is possible that the bait will be swallowed. When this happens, it is easier for a line to be cut by a sharp-toothed fish. Most leaders used for freshwater casting are rather short.

Leaders and Freshwater Trolling

Some anglers use wire leaders when trolling for larger fish like lake trout and king salmon. The trolling line often has several spinners attached to trick fish into thinking a school of baitfish is swimming by. A wire leader is often used with spinner attractors.

Fig. 6.3.
TIPPET CHOICE

Size	Diameter	Approximate Test	Fly Size
7×	.004	1 lb.	14–25
6×	.005	2 lb.	12–20
5×	.006	3 lb.	10–18
4×	.007	4 lb.	8–16
3×	.008	5 lb.	6–14
2×	.009	6 lb.	4–12
1×	.010	7 lb.	2–10
0×	.011	9 lb.	1–8
8/5	.013	12 lb.	2/0–4

(Courtesy *Fly Casting*, by Jim Green, a Fenwick Publication)

Leaders and Saltwater Fishing

Unlike freshwater fish, saltwater game fish often have sharp teeth and sharp scales or gill covers. For this reason, a leader is recommended for most saltwater fishing. If a strong monofilament line of at least 10-pound test is used, a leader may not be necessary. If a fish with sharp teeth is likely to be caught, heavy monofilament or wire leaders are appropriate.

Saltwater anglers fishing with fairly light lines often use what is called a *shock leader*. This is a very heavy monofilament leader that may be classified from 30- to 40-pound test. It can take the punishment and protects the line. Sometimes these leaders are made in two stages, heavier on the terminal end near the fish and lighter at the end that connects to the line.

Questions

1. From what material were the earliest fishing lines made?
2. Name two disadvantages of early fishing lines made from natural fibers.
3. Tell how the war effort in World War II contributed to fishing line construction.
4. What new development occurred in the manufacture of fly lines during the 1950s?
5. Define *softness* in fishing line.
6. Tell what *stretch* in a fishing line means.
7. Define *line test*.
8. State the meaning of *class line*.
9. What type of fishing line is most widely used?
10. State the conditions under which fishing lines should be stored.
11. Name the three types of wire line used today.
12. What type of line is most often used on bait-casting reels with the *free-spool feature?*
13. State the best way to know the type of line to recommend when selling a customer a fly rod.
14. Define *shock leader*.

Projects

1. Select five lines of the same weight test classification that are manufactured by different companies. Use weights to test each line. Continue testing each line until it breaks. You may also choose to use lines made from different materials.
2. At home, in your backyard or in some open area, attempt to cast a lure with a reel filled with a line. Then take enough line off the reel so it is less than half full of line and attempt to cast the same lure. Record the results of each cast.
3. Do a report on the manufacturing process for nylon and Dacron.
4. From the same spool of the pound test monofilament line, cut two 3-foot lengths of line. Put one in a dark closet. Put the other in a place exposed to direct sunlight. Every two weeks, check the condition of each line by lifting an 8-pound weight. Record your activities and note when the line exposed to the sun begins to lose its strength.

7

Fishing Lures

Objectives: *After completing this assignment, you will be able to—*

1. *define the word "sport," as used in "sport fishing";*
2. *list two reasons why fish strike at lures;*
3. *explain what early lures were designed to imitate;*
4. *state the materials the first plug lures were constructed from;*
5. *explain when a dark-colored lure may be preferred;*
6. *state how deep a shallow-running plug will ordinarily drop;*
7. *describe a fishing spoon;*
8. *list the components of a spinner lure;*
9. *name the two types of lures that are combined to construct a spinner bait lure;*
10. *name the type of artificial bait that created a product revolution in the lure manufacturing industry;*
11. *cite the related items to suggest to a person buying a package of plastic worms; and*
12. *name the various kinds of creatures that flies are designed to imitate.*

Have you ever wondered why an angler would buy a plastic worm lure when it is just as easy to buy and fish with real worms? The same is true of most other lures. Why try to match the pattern and color of a certain baitfish when buying a lure if you can buy and fish with the real thing? Are lures really made more for the angler than for fish? It is helpful for a tackle salesperson to know why anglers use lures when fishing.

Reasons for Using Lures

If you asked a group of anglers why they used lures, you would probably receive several answers. Some feel that fishing with a lure is more sporting than bait fishing, and others would say that natural baits are not always available. Many anglers fish with lures because they are not as messy as using live and prepared baits.

Some honest anglers would admit that they just like the looks of certain lures and try them out to see if they will catch fish. Finally, many anglers would say that lures add a dimension to fishing and provide more opportunities to catch fish than is true with live and prepared baits. The following section explores each of those reasons.

Lures Are More Sporting

Some anglers feel that using lures is a more sporting way to fish. The word *sport* may be defined in several ways. Sport may mean *giving the fish a greater advantage,* or it may mean *providing more fun for the angler.* Some anglers feel that using artificial lures gives the fish a greater chance of not being hooked than when bait is used. They feel the angler has to fool the fish into striking the lure, since the fish uses sight, smell, and sound when feeding. Organic foods usually have a scent or smell that fish can use to identify and locate the food. Natural foods, such as minnows, frogs, and small snakes, are often identified by sight and then eaten by game fish. If a game fish sees a wounded minnow swimming along, it is likely to eat it.

Many natural foods are easily identified by game fish because of the sounds or vibrations they make in the water. Bass and pike learn to respond to the sound of a frog or small rodent swimming across the water's surface. Also, fish are thought to respond to the vibrations created by minnows and baitfish as they swim through water.

Since scent is not used as an attractor in most lures, they must appeal to the fish through sight and sound. This means that an angler must select a lure that sounds like a natural food or that resembles what the fish seeks to eat at that particular time. The angler must then present the lure to the fish in a way that will cause the fish to strike.

If you have fished very much, you know that it is not always easy to find a lure that the fish wants. Fish seem to have preferences concerning colors, types of lures, and the ways lures are presented, and these preferences may change daily. For these reasons, many anglers feel that using lures gives the fish an advantage over using natural foods as bait. And they consider lure fishing to be a greater challenge than bait fishing.

Many anglers also feel that using lures is more fun than fishing with bait. They prefer to keep moving, spending the day traveling the shoreline casting to "fishy-looking" places than staying in one spot all day. They would rather hunt the fish than wait for the fish to come to them. This is a good point, but many who use bait also move about and try their bait in many locations during a day of fishing.

Other anglers use lures because they feel that this is a mark of a sportsman or sportswoman. Some in this group even tend to "look down" on people who fish with bait. Most anglers would probably disagree with this view. You might note that almost all saltwater big game fish are caught on baitfish that are trolled behind the boat. What is sport for one angler may or may not be sport for another. Most anglers will agree, however, that using lures is a sporting way to catch fish.

Natural Foods Are Not Always Available or Convenient to Use

Some people prefer to use artificial lures because they are convenient to use. Have you ever carried a minnow bucket full of water and minnows from your car to a fishing spot half a mile away? Then, too, natural baits are sometimes not available, are too hard to catch, and are sometimes difficult to cast.

Have you ever tried to buy live shrimp to use for speckled trout, only to find that none of the bait shops sell it? Certain baits are sometimes in short supply or cannot be found at all. Crayfish are good bait, but they are not always available and usually cost a great deal. Frogs are often good bait, but they are difficult to catch. Wasp larvae are good bait for bream, but have you ever tried to raid a wasp nest? The point is that many natural baits are good, but also hard to get. For this reason, some anglers prefer to use artificial lures that resemble natural baits.

Have you ever bought live shrimp or minnows at a bait shop and then discovered that half died before you reached the place where you intended to fish? Transportation is a real problem with some baits. Live baits can die easily, and some prepared baits must be kept at the right temperature or moisture level if they are to be used successfully in catching fish.

Some baits do not stay on the hook for very long. Others may be too soft and are easily lost during the cast, or washed away by the current. Some baits are easily stolen by crabs or small fish in the area in which you happen to be fishing. It is aggravating to lose bait time and time again, and this also reduces your chances of hooking a big fish. Artificial lures are durable and help the angler avoid most of these problems.

Lures Are Not as Messy as Some Baits

Many anglers prefer to use lures because they are cleaner and more pleasant to use than some baits. Most experienced anglers are not bothered by squirming worms, juicy grasshoppers, wiggly minnows, smelly shrimp, and most other baits. But this is not always the case. It is also true that some who are used to fishing with bait still prefer to use lures. Lures made of plastic, wood, rubber, or metal are normally clean and odor-free.

Experienced anglers often use lures to introduce the pleasure of fishing to someone who may not like the idea of picking up a worm or baiting a hook with a minnow. With a little practice, a new angler usually enjoys casting a lure. This enables one to learn to enjoy fishing without the risk of a bad experience with some types of bait.

Lures Often Catch the Angler

Lure manufacturers spend a great deal of time and money testing new lures to see if they will catch fish. Many lures on the market also seem to do a good job of catching anglers. How often have you seen a lure in a display and wondered how it ought to catch fish? Your feelings may come from experience with a similar lure. But a large number of people buy lures each year just because of the color or shape of the lure. It is true that a pretty lure may be more attractive to anglers than to fish.

Advertising copy for a new lure is also written for the angler. The lure may actually be effective, but the purpose of advertising copy is to catch the anglers' fancy and to motivate them to buy the lure. As a tackle salesperson, you should read all lure ads each month in the sports magazines, so you will know what customers are asking for if they cannot remember the name of the lure.

Experienced anglers know a great deal about lure designs and which companies can be depended on to do research and produce effective lures. These anglers are also easily impressed by new lures and advertising copy that sounds believable.

Almost all anglers are optimists, and they always expect to catch more and bigger fish. They are looking for new and helpful ideas on how to do this. An attractive, well-designed lure, along with good advertising copy, is almost certain to be bought and used by many anglers.

Lures Add a New Dimension to Fishing

One of the most important reasons for using lures is that they add a new dimension to fishing. Bait fishing requires waiting for a fish to decide to eat something. On the other hand, fish strike lures for several reasons besides hunger, as described in the following section.

Instinct and Curiosity Strikes. Some lures that attract fish do not seem to resemble natural food. Fish may strike at these lures out of instinct or curiosity. Instinct strikes often occur when the fish has little chance to identify the lure. Most game fish are predators and feed on smaller fish and other water life. A lure flashing by a bass or northern pike may produce a strike just because the fish sees something small that may be food, and it looks like it is about to get away. Game fish often seem to strike at moving objects with an "eat it now and ask questions later" attitude.

Curiosity strikes occur when a fish encounters something that does not fit into any natural food classifications. As a predator, the fish usually will not hesitate to strike a "new" object, if it is smaller and doesn't seem to threaten its safety.

Strikes Caused by Repeated Casts. Experienced anglers know that fish will sometimes strike a lure that is cast several times into the territory claimed by the fish. For this reason, it is a good idea to cast several times to the same spot when a fish is suspected to be nearby. The theory supporting this is that a fish becomes "annoyed" and finally very "angry" when a lure is thrown into its territory several times. It may take only a few casts to cause the fish to become assertive enough to strike. This kind of situation is usually enjoyed only by those using lures. Most natural baits do not have the necessary durability and type of action to be used in this manner.

Other Dimensions. Lures have come a long way from the first fly or plug created by an imaginative angler. Some have gimmicks like rattles, and others have special bubble-producing features. Many topwater plugs are designed to plop and chug along, making more noise than any self-respecting frog would make while swimming across the water. The scents of natural foods are now being used to attract fish to lures. These tricks or innovations are not usually possible with natural baits. And thus, lures have added a new dimension to the anglers' efforts to catch more and bigger fish.

The History of Lures

Anglers have been trying to trick fish into biting hooks for many centuries. In the third century, A.D., Aleian first recorded the attempts of anglers to catch fish with lures. According to his account, those early-day anglers created lures that imitated an insect by covering a hook with red wool and then fastening two feathers to appear as wings. This fly did cause fish to strike, according to Aleian's account.

Most early lures were developed to imitate foods that anglers saw fish strike at and eat, the earliest of which were flies designed to imitate insects. But it is likely that other imaginative anglers built lures that tried to imitate frogs, snakes, mice, and other natural foods.

It is thought that the first use of wooden lures occurred in Michigan. According to legend, a person threw a plug from a barrel into a river and saw a fish strike at it. Anglers then began whittling wooden lures from barrel plugs and other pieces of wood. These lures were called *plugs*, after the barrel plug, and many casting lures are still referred to as such.

Spoons were "discovered" when someone dropped a spoon overboard while boating, and a fish struck at it. The person observing this and others who learned about it began to experiment with flashy pieces of metal as a way to attract fish and to trick them into biting the hook.

Spinners were developed in Europe and were widely used by anglers in the United States during the 1940s. Lure manufacturers in this country used the spinner concept to develop most of the spinner baits on the market today.

Lure manufacturing has greatly benefited from this country's advanced technology. Plastics have been improved to the point that more lures are now made from plastic than from wood. Soft plastic baits, such as the *plastic worm*, are relatively new on the market, first appearing in great numbers in the early 1960s. Today's plastic worm is generally much better than those produced in the 1960s. Considering the advancement of lure production during the past 20 years, it's hard to predict what the angler will have to choose from during the next 20 years.

Construction of Lures

As a tackle salesperson, you should understand the basic construction of various types of lures. It's true that some anglers buy lures impulsively, letting emotion overcome logic in their selection. For those persons, it is not usually necessary to go into detail about lures.

Other customers will be more curious. For them, it may be necessary for you to be ready to answer questions about what a lure is made of, how the color is applied, why some lures run deep while others run shallow, what makes a lure weedless, and so on. This section includes a brief discussion on lure construction (see fig. 7.1).

Materials Used in Making Lures

Early lures were made from natural materials. Flies were made of dyed wool, feathers, deerhair, and other natural elements. Plugs were first made of wood. Synthetic materials began to be used in lure construction and replaced many of the natural elements by the 1950s. Since the 1950s, synthetic products have become even more popular in lure construction.

Wood. Early plugs were made of wood, and some of them are considered to be collectors' items. Wood is still used in the manufacture of some plugs. Balsa wood lures are still produced by some companies, but they are expensive. Wooden lures are turned out on a lathe and then painted the desired color and pattern. Rings for hooks are screwed into the wood. Although anglers still admire the quality and action of wooden lures, wood has largely been replaced by plastic.

Plastic. Plastic is used in the construction of most of today's lures. These lures are produced by plastic injection molding machines that can make hollow or solid plastic lures. Plastic easily molds around the metal pieces used in manufacturing lures. One of the biggest advantages of plastic over wooden lures is that the color of the lure can be built into the plastic. This means that the color and pattern on a plastic lure will be retained, even after the lure has been chewed on by a hooked fish.

Plastic worms and other soft plastic lures are made from a very flexible plastic. These lures have a live action which fish and anglers like to see. The soft plastic lures can also be colored during the molding process. Some anglers save pieces of plastic worms for remolding later on.

Metal. Most metal lures are made of stainless

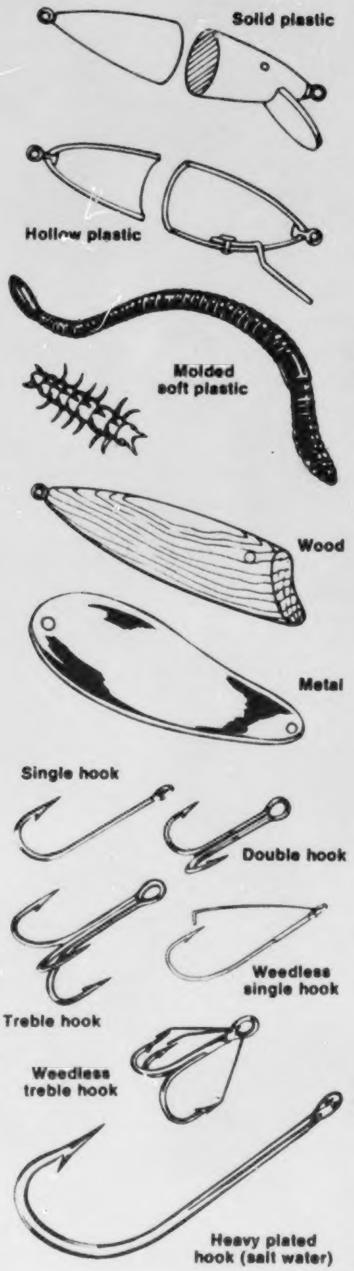


Fig. 7.1. Types of Lures (Courtesy AFTMA)

steel, or they are treated to resist corrosion. Metal spoons and spinner baits are turned out by stamping machines. Each type of spoon or spinner has its own design and its own action. Metal shafts are used in the construction of many metal lures. Spinners, plastic tails, and feathers are arranged on the shaft so that the lure will resemble something a fish might eat.

New Products. Lure manufacturers are always trying to improve their products. They spend a great deal of time and effort in researching new designs and materials for lures. These efforts have helped the lure industry to grow and to provide a greater selection of products to anglers. Cotton Cordell, for example, developed a product called Balsa Lite which is not wood, Styrofoam, or plastic, but which has many of the qualities of wood. This and other new materials that will be discovered or adapted in the future will help lure manufacturers to continue to assist anglers in their search for better lures.

Hooks Used in Lures. A lure will have at least one hook, and some have as many as four or five. Most have at least two. Hooks used in lure construction may be single, double, or treble hooks. *Weedless* types are usually available in each of the three hook styles. On a weedless hook, a piece of metal or plastic is attached which keeps the point from hitting a log, rock, or tree as the lure is pulled through the water. The plastic or metal guard is limber enough to move and expose the point of the hook, if a fish strikes the lure.

Most spinner baits have only one hook, which may be a single, double, or a treble hook. Jigs have one single hook, and spoons usually have only one hook, which may be a single, double, or treble hook. Most plugs have two or three treble hooks. These hooks are attached to eyelets or rings which are fastened to the body of the lure.

Matching Lures to Fish and Conditions

An important part of fishing with lures is being able to select the right lure at the right time. Unfortunately, no one has learned to do this 100 percent of the time. Even the very best anglers have days when it seems that nothing in the tackle box will catch a fish. However, there are some things to remember that increase your chances of catching fish, all of which deal primarily with matching your lure to the fish, the weather, and the water conditions.

Matching the Lure to the Fish

Some fish seem to respond to specific lures, and others seem willing to strike at almost any lure that goes by. Still others seem reluctant to strike at any lure. Common sense can guide the angler in selecting lures. It is not likely that a walleye will strike a large-surfaced lure. This is because walleye tend to stay in relatively deep water. An angler would probably not use a long plastic worm when fishing for crappie, because these fish seem to prefer smaller lures like jigs, spoons, and small plugs.

Standard Lures for Certain Fish

It is difficult to say definitely that any lure is always good for catching a specific game fish. Fishing habits sometimes are different from one part of the country to the next. The tackle salesperson must learn what is "standard" where the customers fish. Most bass caught from one lake may seem to be caught most often on plastic worms. The bass in another area may seem to prefer spinner baits.

Fish sometimes refuse to act in a predictable way. Some people, for example, do not think that catfish will strike at artificial lures. The truth is that channel catfish will strike many lures, especially spinner baits, and they are also known to strike wet flies.

The tackle salesperson still needs to know that certain lures are recognized as favorites with certain fish. Bass will strike almost any lure and will take dry and wet flies, all kinds of plugs, spinner baits, spoons, and all types of plastic baits. Crappie prefer smaller jigs and spoons. They will also strike at small, swimming plugs and spinner baits. White bass will strike at most lures but seem to prefer spinner baits, spoons, and jigs. They will also strike swimming lures. Walleye are taken on several types of lures. They seem to prefer spoons, spinner baits, and jigs or spinners with a worm attached to the hook. Deep-running plugs and swimming baits may also be effective.

Muskellunge are large fish. Anglers may use large lures especially designed for "muskie" fishing, but smaller lures may also be used. Spinner baits, crank baits, and swimming baits are all used for muskie. Northern pike are vicious feeders. Traditional lures for this fish include spoons and spinners. Plastic worms, jigs, and swimming lures are also used. Most trout will take wet or dry flies. Small spoons, spinner baits, and small, swimming plugs are also good for trout.

Remember that fishing with lures leaves a lot of room for experimentation and luck. If fish will not strike the "standard" lures, the angler should use imagination and try other lures. As a tackle salesperson, your job is to know which lures usually are effective in the area fished by your customers. You should also try to stay informed about new lures being used. With this information, you can recommend both "standard" and "new" lures that you know have caught fish in your area.

Lure Size and Fish Size

Some people say that smaller lures catch more fish. Others say that one should use large lures if one expects to catch large fish. Both statements are true most of the time. It is reasonable to assume that there are more small fish than large fish in a lake or stream. Since almost all of these fish can swallow a small lure, it is possible that almost any game fish in the lake or stream could strike a small lure. Large lures often automatically eliminate strikes from smaller fish. This is because the fish are afraid of the lure or are unable to swallow it.

The angler must give some thought to the size of fish that is likely to be in the fishing territory. Rainbow trout, for example, strike at spoons. An angler fishing in a freshly stocked mountain stream would not want to use a 4-inch-long silver spoon to try to catch trout that are only 6 to 8 inches in length.

On the other hand, the 4-inch spoon may be a good lure to use while fishing for rainbow trout in a lake. These fish may weigh 6 to 8 pounds or more and can easily handle the large spoon. When fishing for any species of fish, the angler should try to match the size of the lure to the size of the fish most likely to be found in a specific fishing area.

Lure Color

Color is sometimes a big issue in lure fishing. Research tests have proven that bass and most other species can definitely distinguish among a wide spectrum of colors. The tackle salesperson should try to keep informed about lure colors and patterns that are most popular with anglers in the area. This can change rapidly, so it is important to talk to customers about what the fish are hitting.

Although color preferences exist, it is difficult to understand why some color combinations are preferred by fish. It seems logical that colors and patterns should resemble natural foods like frogs, minnows, and bait[illegible]. While the natural colors and patterns should be tried, the angler may find unnatural colors like pink, chartreuse, or hot orange to be very effective.

Water conditions may sometimes influence the effectiveness of a lure. Dark lures are often considered to be best when the water is murky or during the dusk or dawn hours when there is not much light. Spinner baits, spoons, and spinners are considered good for murky or muddy water, as are lures with good sound-producing actions or devices.

Classification of Lures

You have learned that many different types of lures can be found in America's tackle shops. As a tackle salesperson, you should be familiar with each of these. Not only should you be able to recognize the types of lures, you should also have an understanding about how each lure should be fished and the kinds of fish it may attract. This section describes the different kinds of lures that you may sell.

Plugs

Plugs were originally made for use with bait-casting equipment. Early plugs usually weighed about 1 ounce. Today, we find plugs in many sizes. Some may be no more than an inch long and weigh ¼ ounce or less. Recently, even smaller ⅛-ounce plugs have become popular. Others may be 7 inches or longer and weigh 2 or 3 ounces. Lure manufacturers have developed a plug for almost every kind of fishing. There are even plugs for ice fishing.

A plug may be classified by its action or according to the depth it is designed to attain. Every style of plug can be found and in almost any color or pattern imaginable. In this assignment, plugs are classified according to their depth levels.

Topwater Plugs

Almost all of these plugs float and are designed to create a disturbance on the surface of the water. Some topwater plugs have wide lips on the front that create a burbling sound as the lures are pulled across the water. The Jitterbug is one of the oldest and best-known of these lures. Other topwater lures have hollowed-out noses that create a chugging noise as they are jerked along the surface of the water. The Chugger lure is one of many with this feature. These lures are usually fished with short jerks. They will often attract strikes when strongly jerked two or three feet at a time, producing as much noise as possible.

Other topwater plugs have propellers that make noise and bubbles as they are pulled across the water. The Devil's Horse is a good example of this type of plug. These lures may be run fast but are usually run slowly, with short slurps and jerks. This type of lure is sometimes called a stick-bait. The Darter is another type of topwater plug. This lure floats but has little, if any, action and makes little noise. This plug is usually small and is pulled across the surface in short, darting motions.

Shallow-running Plugs

This class of plug is designed to run just under the water's surface. They usually do not run much deeper than 1½ feet. Most of these plugs have small lips that cause them to dive under the surface. A lip is usually a piece of plastic or metal attached to the plug. Some plastic plugs are molded so that the front of the plug acts in the same way as a lip. Some shallow-running plugs are called swimming lures because their tails move back and forth in a swimming motion. The River Runt is a good example.

Other plugs in this category may be long and slender. Their action is a rapid, quivering motion which is more of a vibration than a swimming action. The Rapala balsa floating models are good examples of plugs having this quivering action.

Other shallow-running plugs may be short and fat. They usually have a lip to force them under water. The Rebel "R" series of floaters and shallow runners are examples. Anglers use these and several other of the "pot belly" lures with good success.

Medium-Depth Running Lures

Most plugs that run at a medium depth have a lip or a bill to force them to that depth. The lip or bill is longer than that found on shallow-running plugs. These plugs may have a swimming action, and many have the rapid vibration action just mentioned. Sinking plugs, such as the Hotspot, are sometimes fished at a medium depth. The Hotspot and most other sinking plugs do not have a bill to force them under the water. They are designed to sink about a foot per second. The angler counts until the lure has sunk to the desired depth, and then the retrieve is begun. Some of these plugs have a swimming action, while others have a vibrating action (see fig. 7.2).

Deep-running Plugs

Most deep-running plugs are designed to attain an 8- to 12-foot depth. Some are made to go deeper. Most can descend farther, if a weight or device designed for deepwater trolling with plugs is used. Most deep-running plugs have a large lip that forces them down as they are pulled through the water. The depth of the plug can usually be increased by speeding up the retrieve or by speeding up the trolling boat. Surprisingly, many deep-running plugs float until the retrieve begins. The Bomber and the Hellbender are two of the better-known deep-running plugs, and there are many other brands.

Deep-running plugs may be fished in several ways. They are used a great deal as trolling lures. When casting, the lure is often reeled in at a steady pace. Little effort is made to give action to these lures, since most of them have a built-in swimming or crayfish action. Sinking plugs may be allowed to sink several feet before the retrieve is begun. Floating deep-running plugs may be run in several ways. They may be reeled in steadily, or the angler may occasionally stop reeling and allow the lure to rise a few feet. These lures may be run on top of the water by reeling in two or three turns, stopping the reel, and allowing the lure to rise to the surface (see fig. 7.3).

Spoons

A spoon is one of the most effective of all lures and resembles a minnow as it flashes through the water. All game fish will take spoons. These spoons should be fished slowly, so they will sink to a greater depth. They may also be reeled in very quickly, if the fish are striking at baitfish. The fast retrieve is especially good when casting to schooling fish such as white bass, black bass, and many saltwater game fish; the fast-moving spoon resembles a baitfish trying to escape.

Spoons may also be jigged straight up and down. This is very effective when fishing over points of land that jut into the water. This tactic may also be used when the boat is allowed to drift over a lake bottom relatively clear of trees and brush. Jigging the spoon up and down is used often when fishing for crappie in flooded timber.

Spoons come in all sizes and colors and shapes (see fig. 7.4). Most range from an inch to 6 or 7 inches in length, and even larger ones may be found. A spoon is a piece of flattened metal that has an attached hook. The hook is usually attached by a split ring, but is sometimes soldered to the concave surface of the spoon. This is often the case when spoons have weedguards. Some spoons are thick and others are very thin. Thick spoons are easier to cast, especially if the wind is blowing.

Spoons are used with all types of fishing equipment. There are even tiny spoons that can be used with a fly rod. The spoon is a popular lure in both salt and fresh water. If you are ever asked to assist a new angler in stocking a tackle box, you should recommend one or two spoons that are popular in your area (see fig. 7.5).

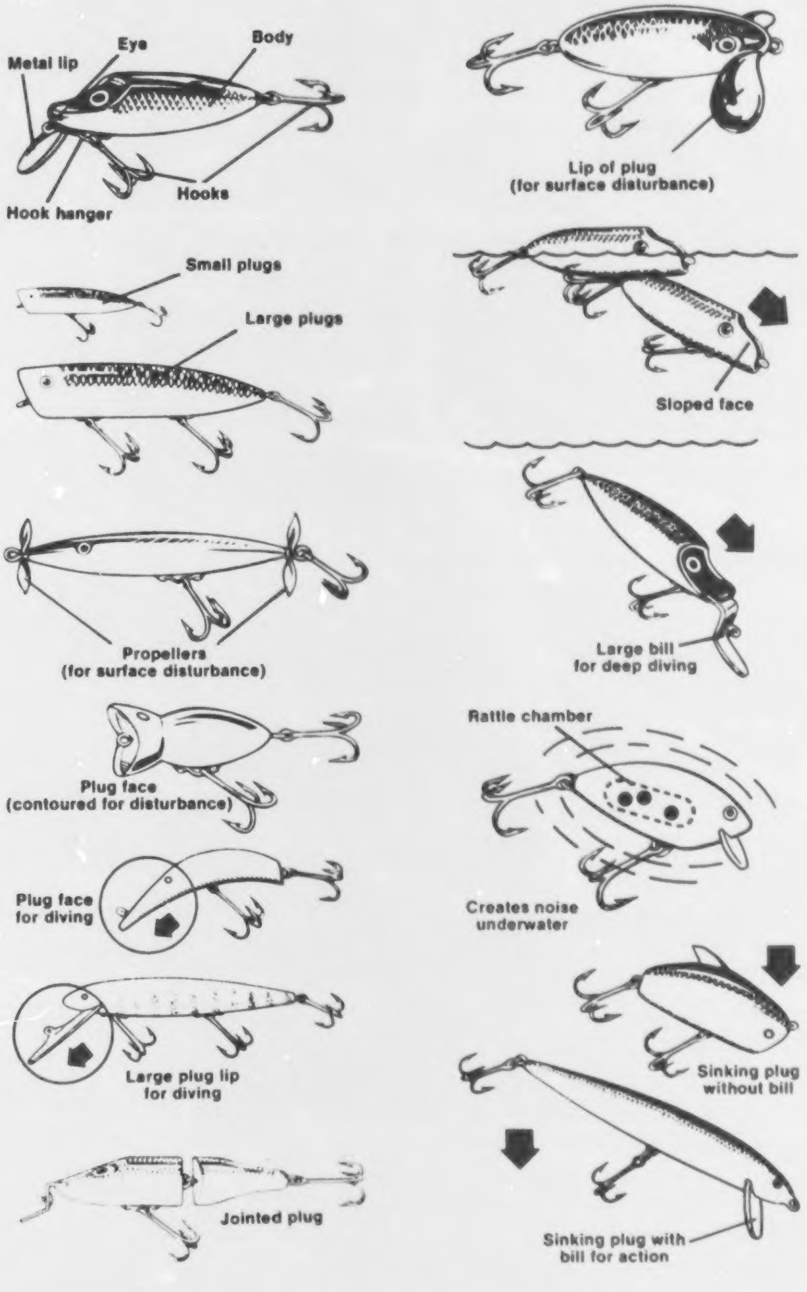

Metal lip
Eye
Body
Hook hanger
Hooks
Small plugs
Large plugs
Propellers
(for surface disturbance)
Plug face
(contoured for disturbance)
Plug face
for diving
Large plug lip
for diving
Jointed plug
Lip of plug
(for surface disturbance)
Sloped face
Large bill
for deep diving
Rattle chamber
Creates noise
underwater
Sinking plug
without bill
Sinking plug with
bill for action

Fig. 7.2. *Types of Plugs*
(Courtesy AFTMA)

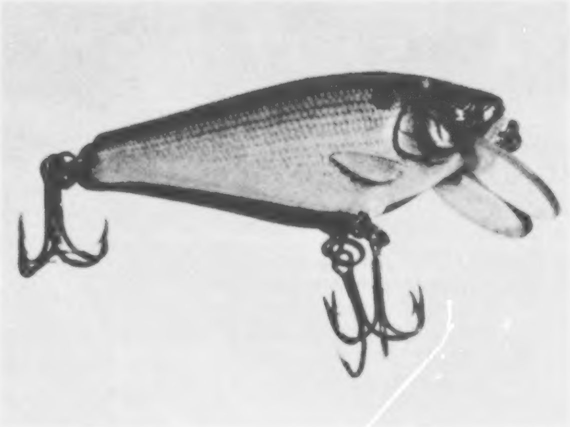


Fig. 7.3. Plug
(Courtesy Oshman's Sporting Goods, Austin, Texas)

Spinners

Spinners and spoons are similar in the manner that they attract fish. The spinner flashes through the water and is intended to look like a minnow or baitfish to larger fish. The main difference between the two lures is that the spinner usually makes a complete revolution on its shaft. The spoon does not turn completely over but is designed to wobble back and forth.

Spinner lures are made of a blade, a shaft, and a hook (see fig. 7.6). The blade is an almost flat piece of metal with a concave surface on one side. This causes the blade to spin as it is pulled through the water. The shaft is a straight piece of wire. The blade is usually attached to the shaft with a U-shaped clevis that allows the blade to rotate.

Some blades have a hole in them that the shaft fits through. This is true of the June Bug spinner. The shaft may be made of tinned piano wire, brass, or nickel silver. After hooking a strong fish, the angler should always check to see if the clevis or the shaft has been bent. The hook on a spinner may be a single, double, or treble hook. Usually, only one hook is used on a spinner with a single blade.

Other spinners may have lead or plastic bodies molded onto the shaft. The body may be designed to look like a minnow, or it may only make the spinner look larger and provide more weight for casting. On spinner lures, the hook may be covered with feathers or a skirt made of plastic or hair, or it may be bare. While most spinners have only one blade, some anglers string several blades on a length of wire as long as four feet. This gives the appearance of several baitfish swimming together.

The flash of the spinner is the main attraction of fish to the spinner lure. In addition, fish may be attracted to the lure's movement through the water. Another attraction may be the vibration

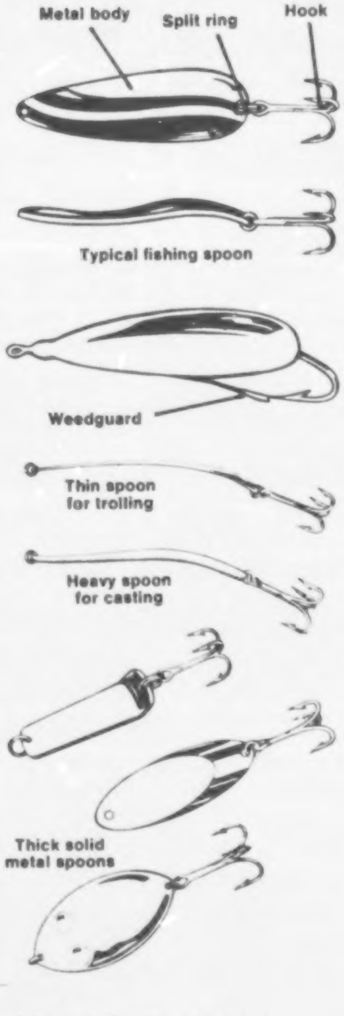


Fig. 7.4. Types of Spoons
(Courtesy AFTMA)

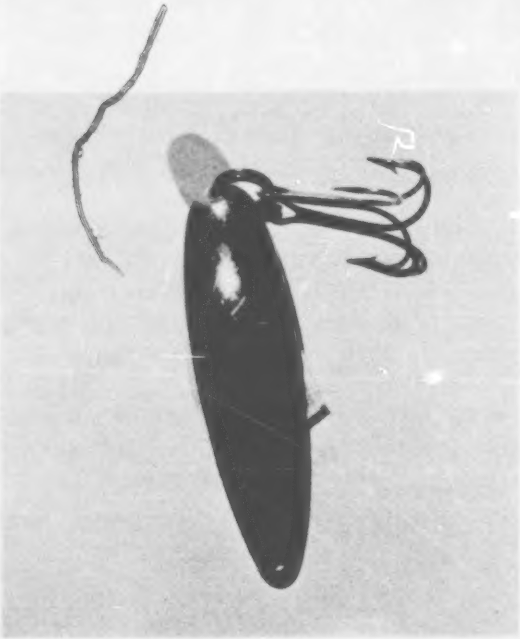


Fig. 7.5. *Spoon*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

of the blades as they rotate on the shaft. Fish are thought to be able to detect the vibration in the water (like sound waves in the air) caused by other fish when they swim. Some anglers feel that blade vibration is as important as blade flash, especially in muddy or murky water.

Jigs

A jig is a piece of lead molded onto the shank of a hook. The hook's eye often appears to be attached to the piece of lead and not to the shank of the hook because hooks used in jigs usually have an offset eye. The jig is usually decorated with a rubber or feather skirt designed to hide the hook (see fig. 7.7).

Jigs usually don't resemble any food a fish might eat, when seen out of the water. They take on a much more lifelike appearance when in the water. The color and up-and-down movement of the jig through the water is thought to cause fish to mistake it for a darting minnow or baitfish.

Jigs are made in all sizes and colors. They are popular lures for spinning, bait-casting, and saltwater tackle. Small fly rod jigs are also manufactured. Jigs (see fig. 7.8) have no action of their own, but are given action through movement of the rod tip and by the speed that they are pulled through the water. Most anglers fish jigs very slowly, with short hops caused by raising and lowering the rod tip. The rod tip is raised to about 45 degrees and is

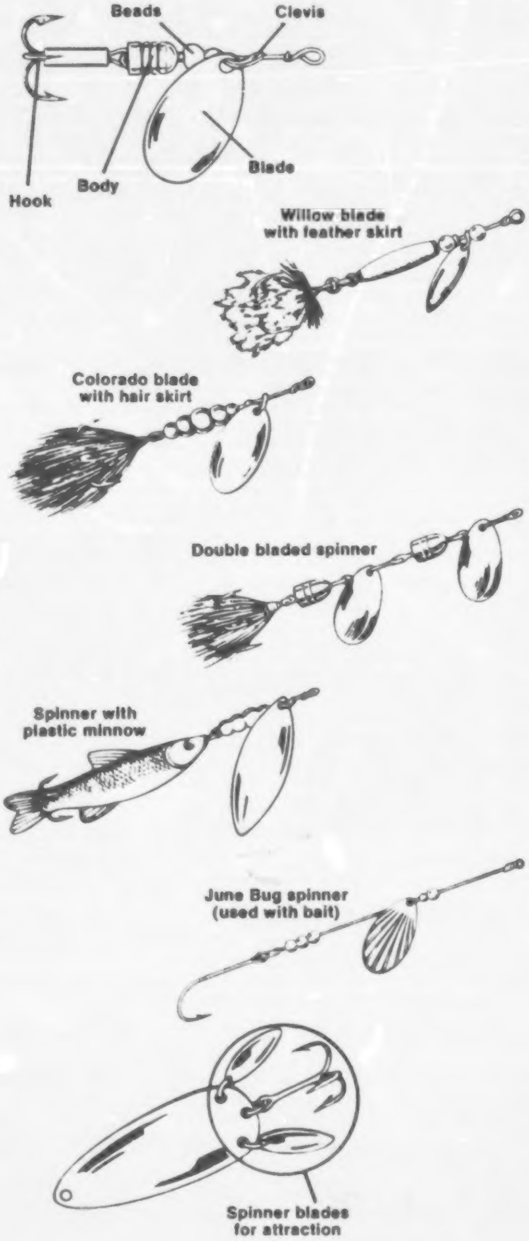

Beads
Clevis
Blade
Body
Hook
Willow blade with feather skirt
Colorado blade with hair skirt
Double bladed spinner
Spinner with plastic minnow
June Bug spinner (used with bait)
Spinner blades for attraction

Fig. 7.6. *Types of Spinners*
(Courtesy AFTMA)

then dropped to a horizontal position. This raises the jig and then lets it settle back to its original depth. This action is repeated over and over as the jig is retrieved. As the rod tip is lowered, the angler reels in the slack line. Jigs may also be fished straight up and down.

This is a good trick to use when crappie or other fish are located in submerged brush and trees. The angler must always be ready for a strike which often occurs as the jig is dropping (when the rod tip is lowered). For this reason, the angler must try not to drop the tip so quickly

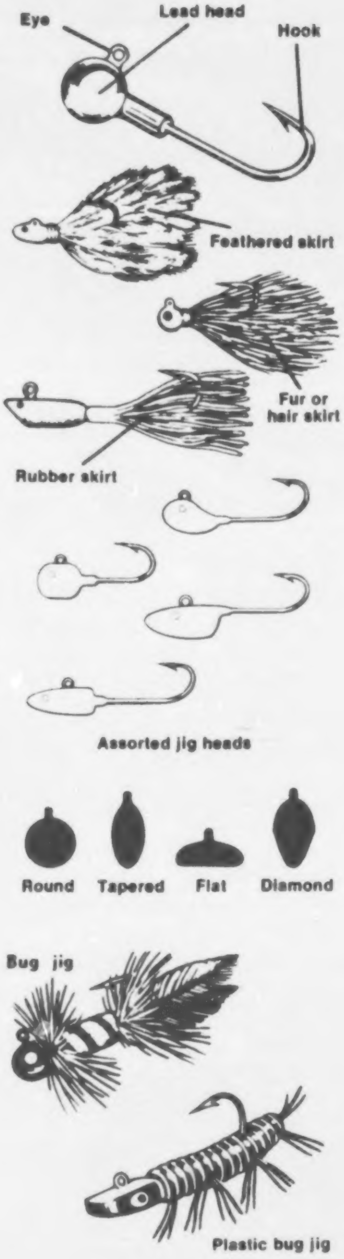

Eye
Lead head
Hook
Feathered skirt
Fur or hair skirt
Rubber skirt
Assorted jig heads
Round
Tapered
Flat
Diamond
Bug jig
Plastic bug jig

Fig. 7.7. Types of Jigs
(Courtesy AFTMA)

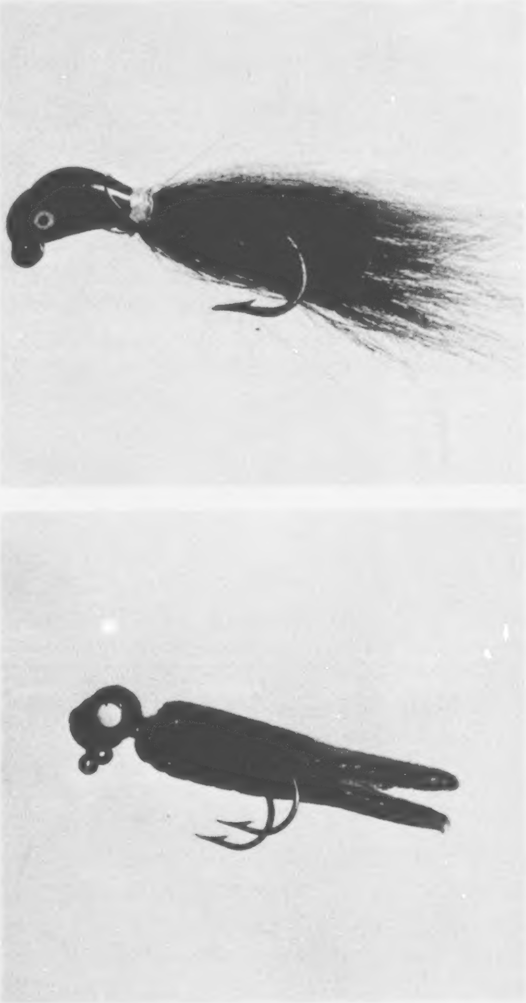


Fig. 7.8. Jigs
(Courtesy Oshman's Sporting Goods, Austin, Texas)

that the line goes slack. Jig[illegible]kes practice, but it can be very productiv[illegible]nother productive technique is a slow, steady swimming retrieve. At times, it will outproduce the rise-and-fall technique.

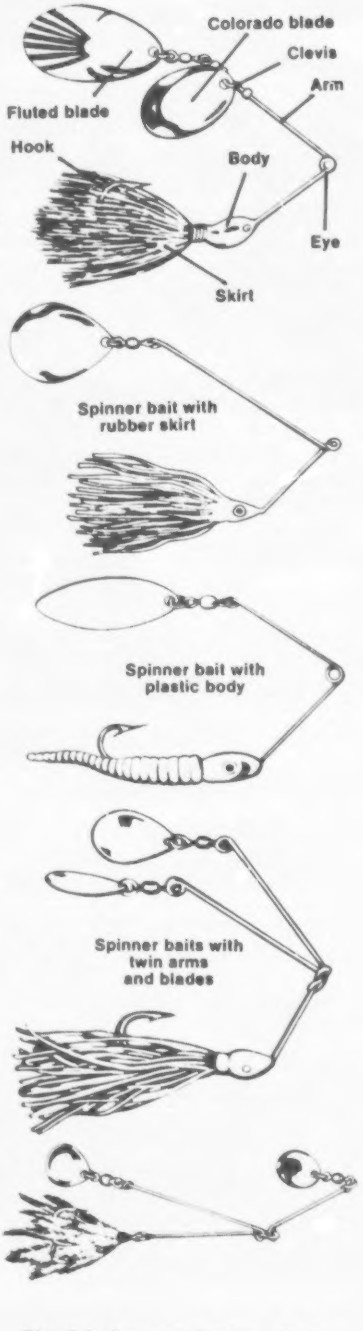

Colorado blade
Clevis
Arm
Fluted blade
Hook
Body
Eye
Skirt
Spinner bait with rubber skirt
Spinner bait with plastic body
Spinner baits with twin arms and blades

Fig. 7.9. Types of Spinner Baits (Courtesy AFTMA)

Spinner Baits

A *spinner bait* is a lure that is actually a combination of a spinner and a jig (see fig. 7.9). A spinner bait is a piece of wire with a jig attached to one end and a spinner blade attached to the other end. There are many variations of this lure. The jig may be just a lead head with a hair or rubber skirt. Other spinner baits have a lead head and a plastic body. The lure may have a single shaft with one or two spinner blades. It may also have two shafts with a spinner blade on each shaft.

Single hooks are used on most spinner baits, but some have treble hooks. These hooks are usually hidden by a rubber or hair skirt. Some spinner baits with plastic bodies have no covering on the point of the hook. In these lures, the plastic body usually is longer than the hook and partially hides it.

Spinner baits are good for most types of water. They are not completely snagproof, but the arms and spinner blades help protect the hook from hitting snags and underwater branches. It is surprising how often a spinner bait can be cast into the top of submerged brush and trees without hanging up.

Spinner baits (see fig. 7.10) are very versatile and can be fished in several ways. With a high-speed reel, the lure can be buzzed over the surface of the water. Spinner baits have their own built-in action. Anglers can cast and reel them in without attempting to give extra action to these lures.

Probably one of the most effective techniques is to cast a spinner lure into deep water and let it sink to the desired depth. The lure is then reeled in with a series of hops by raising the rod to an almost vertical position, and then slowly lowering the rod back to a horizontal position. Watch for a strike as the spinner bait is falling. Since this lure is somewhat snagproof, anglers should not hesitate to cast it into places where fish may be hiding, such as submerged treetops, tall grass, and around stumps.

The spinner bait will catch fish and is very versatile. The tackle salesperson should not hesitate to recommend this lure to a customer.

Soft Plastic Lures

If a revolution ever occurred in the field of fishing lures, it was when the plastic worm was finally accepted by this nation's anglers in the 1960s. After several years, technology made it possible to produce a lure that could be molded into almost any shape and still be flexible. Advanced technology and improvements have made plastic worms one of the most popular and productive lures of all time (see fig. 7.11). They come in several styles, and most are designed for the do-it-yourself angler who rigs the plastic lure.

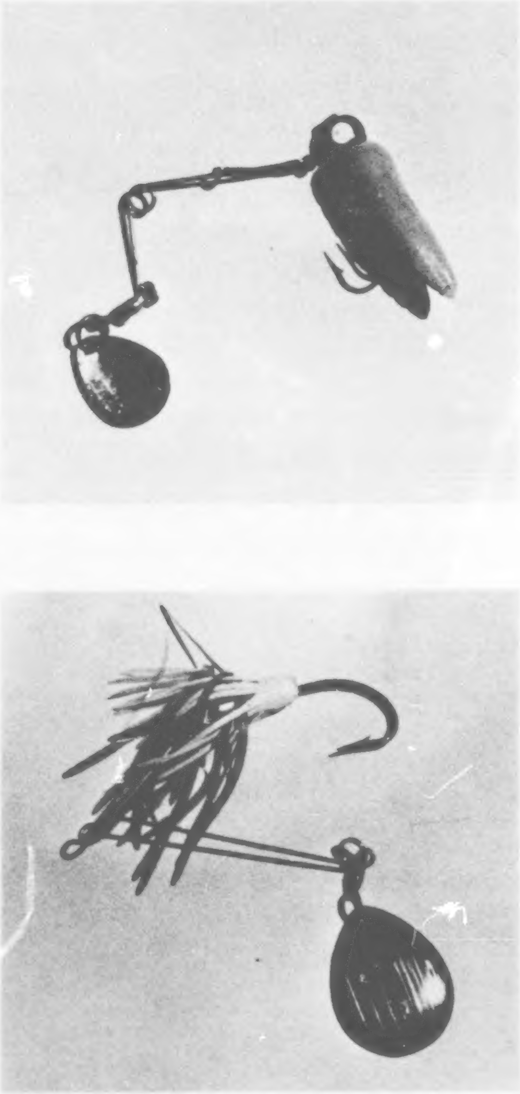


Fig. 7.10. Spinner Baits
(Courtesy Oshman's Sporting Goods, Austin, Texas)

The angler places a slip-weight on the line and ties a hook to the line's end. The hook is then inserted into the end of the worm at the head, run through the body of the worm for an inch or so, and then out. The hook may be left exposed, or the barb may be stuck back into the worm, making the lure weedless (that is, it won't catch on weeds). This technique is sometimes called the "Texas Rig."

A good tackle salesperson always suggests weights and hooks to an angler who buys a package of plastic worms. Some lures are manufactured with a jig head molded onto a single hook. A plastic worm is attached to the jig and hook. Occasionally, one will find hooks along the body of the worm. Most manufactured plastic worm lures have weedless hooks.

Some anglers prefer to leave the barb of the hook exposed. Still others use no weight, but allow the worm to slowly sink toward the bottom. This is a very good technique in shallow water.

Plastic worms (see fig. 7.12) may resemble natural worms but more closely resemble small snakes, a natural food for most game fish. These lures can be adapted for use with all types of tackle and will catch most freshwater and many saltwater game fish. The worm is usually fished slowly, with the same hopping action described for the spinner bait. This is also a good lure for vertical fishing. Dropping a plastic worm down beside a tree trunk or into the top of a submerged tree will often produce a fish. In this technique, the worm is jigged up and down.

Many kinds of plastic worms are on the market. Some are scented to help cover the smell of the human hand. Some have built-in rattles, others have split tails, and colors vary from solid and two-tone to several color combinations. The worm may be from 3 to 15 inches long. Most are 6 to 9 inches long.

Plastic eels and lizards are also produced by most companies that manufacture plastic worms. These lures tend to be more seasonal than the plastic worm. While the worm is used year-round, eels and lizards are often considered winter and spring lures. Eels and lizards may be rigged and fished in the same way as the worm.

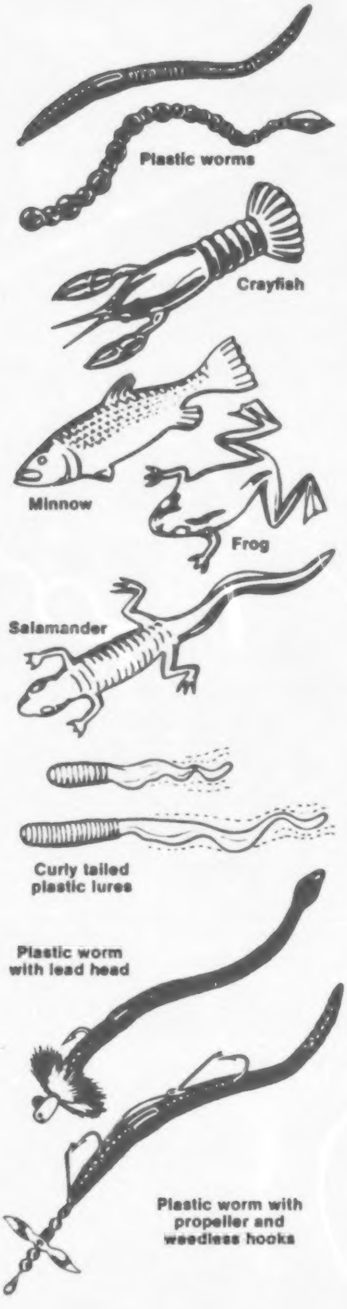

Plastic worms
Crayfish
Minnow
Frog
Salamander
Curly tailed plastic lures
Plastic worm with lead head
Plastic worm with propeller and weedless hooks

Fig. 7.11. Soft Plastic Lures (Courtesy AFTMA)

Several other types of soft plastic lures are manufactured, including imitations of frogs, minnows, grasshoppers, crickets, crayfish, and shrimp. The grub is a soft plastic lure that looks like a short, thick worm. The body is usually about 2 inches long, and it has a flexible tail. The grub is usually placed on a lead jig head and is very effective when fished along steep, rocky banks and cliffs.

One thing to caution the customer about is the fact that some plastic lures will corrode metal tackle boxes. Others will react with other plastic lures and make a sticky, gummy mess in the tackle box. It is a good idea to suggest that the angler buy a special plastic box for safe storage of plastic lures. This purchase will probably save the angler money in the long run.

Flies

The term *fly* designates the type of lure used with a fly rod. It was originally called this because the first such lures were imitations of various flying insects. The fly is the oldest type

Fig. 7.12. Artificial Worm (Courtesy Oshman's Sporting Goods, Austin, Texas)

of lure. Although lures used with fly rods are usually called flies, some of them resemble creatures other than flying insects. Flies may imitate minnows, baitfish, eggs, mice, and frogs, as well as hopping insects like grasshoppers and crickets.

A fly consists of a hook that is decorated with natural or artificial materials. The shank of the hook is usually wrapped with some material like wool, thread, or tinsel. This is called the body of the fly. The choice of material used to wrap the shank of the hook rests upon whether the fly is supposed to sink or to ride on top of the water. Many flies have hair or other material near the front of the fly. This is called *hackle*. Wings for the fly and the tail are usually made of feathers.

There are many patterns (species) of flies. The tackle salesperson in an area where flies are widely used should study these patterns. Many books are illustrated with these patterns used in fly tying. You may check to see if a copy is in your local library.

Many tackle shops sell materials and equipment to anglers who tie their own flies. The tackle salesperson should become familiar with these. Many artificial and natural materials are used in fly tying, and it takes time for one to thoroughly learn about this part of the tackle business.

There are many different types of flies. Some sink and some float, some resemble insects while others resemble small fish, and still others are made to look like small reptiles or rodents. Figure 7.13 shows several types.

Dry Flies

Most people who are unfamiliar with fly fishing think first about dry flies when fly fishing is mentioned. Dry flies are tied on very light hooks and are designed to ride on top of the water. They resemble insects that have fallen or have alighted on the surface of the water. Dry flies will eventually become waterlogged, if they are not treated with a dressing designed to keep water from soaking into the wool, feathers, or hair of the fly. Fly fishing purists consider dry fly fishing to be the greatest fishing experience, and many fish exclusively with dry flies.

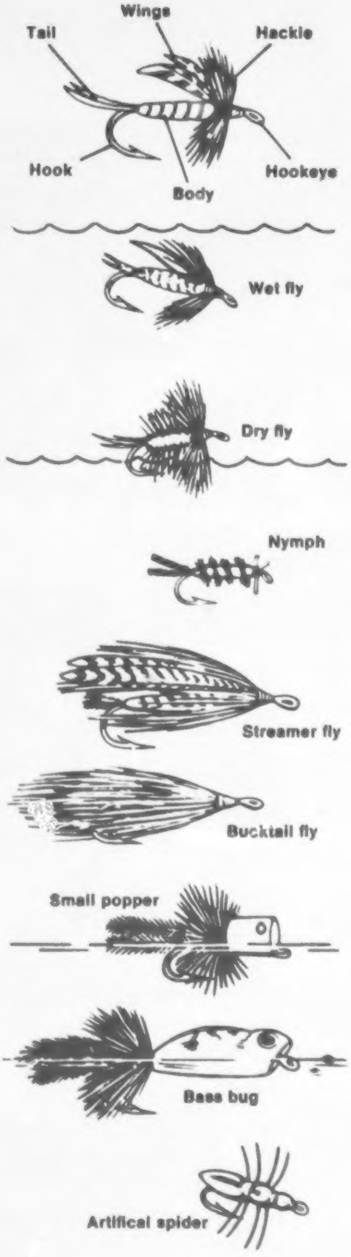


Fig. 7.13. Flies (Courtesy AFTMA)

Wet Flies

A wet fly is designed to sink below the surface of the water. This type of fly imitates insects that have drowned and sunk into the lake or stream. The wet fly is cast and then allowed to sink. The current then is allowed to carry the fly downstream and, the angler hopes, into the places that fish are hiding while waiting for food. The angler must be alert for the strike.

The current often causes the line to "belly out" or develop a large bow. When this happens, the angler has a lot of slack line between him and the fish. This causes the jolt of the fish's strike to be delayed in reaching the angler. The angler's strike is also softened by the slack line, and the fish may be gone before it is hooked. This is one good reason why hooks on all lures should be kept extra sharp.

Nymphs

A nymph is a fly that is carefully designed to imitate a water insect just emerging from its egg, usually in the form of a larva. It is fished under water (see fig. 7.14). While a wet fly imitates dead food and doesn't look fresh, the nymph is designed to imitate a living insect. The nymph must exactly resemble the other insects that are hatching from eggs at a particular moment. This is called "matching the hatch."

If the fish are feeding on nymphs of a particular insect, they will often ignore a fly that imitates a different insect. Part of the skill in fly fishing is being able to match the pattern of the nymphs that the fish are eating.

Streamers and Bucktail Flies

These flies are designed to imitate minnows or small baitfish. They are pulled along under the water's surface, activated with the rod tip. They are not allowed to just drift with the current, like a wet fly. While both the streamer and the bucktail flies are designed to imitate minnows, they are different from each other. A streamer fly is tied onto a hook of standard length and has a feather wing. A bucktail fly is tied onto an extra long hook and has a wing made from deerhair or hair from some other animal.

Popping Bugs

A popping bug is a fly that floats on the water's surface. It makes a disturbance when it is retrieved, much like a topwater casting plug. The body is usually made of cork, balsa wood, or plastic, and a feather or hair usually hides the hook. Popping bugs may be very small and are used mainly from bream and panfish.

Other popping bugs are very large in comparison to other types of flies and are designed to attract bass. They resemble small insects or frogs. Some of the larger flies are designed to resemble mice or other small animals that may sometimes swim in shallow water. These flies are effective with bass and pike.

Plastic Spiders

A popular panfish fly is the plastic spider. This lure resembles a water spider or some similar insect. The spider lure usually has a plastic body that is molded onto the hook, and rubber or plastic legs are attached to the body. This is a very popular lure for bream.

Saltwater Flies

A number of saltwater anglers are now using fly rod equipment. Flies for saltwater fishing are

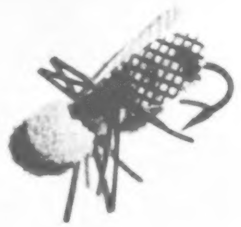


Fig. 7.14. *Nymph Fly*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

usually large and make enough commotion in the water to attract a fish. Many are brightly colored so that fish in the area are more likely to see them.

The tackle salesperson will encounter some anglers who are fairly casual about fly fishing. Others will be very serious about their fly fishing equipment and the selection of flies or accompanying materials. If you are employed in an area where fly fishing is popular with many anglers, you will need to devote a great deal of time to studying the fly patterns used by your customers.

Saltwater Lures

Many of the lures used in fresh water can also be used in saltwater fishing. There are lures, however, made especially for saltwater fishing, and some of the popular freshwater plugs are made in "magnum" size for saltwater fishing.

Most saltwater plugs have a feature, not found in may freshwater plugs, called "through-wire construction." This means that a wire or a plate is inside the lure, and all hooks are attached to the wire or plate. The line from the reel is also attached to the wire or plate. This prevents fish like bluefish, barracuda, and others from escaping if they happen to bite the lure in two.

Some spoons are designed mainly for use in salt water. These may be a foot or more in length. Some spoons are designed for trolling, while others are jigged up and down in deep water (see fig. 7.15).

A tin squid is a metal lure used in surf fishing. It is cast into the surf when fish are feeding or into holes or pockets gouged out of the ocean's bottom by the current.

Surgical tubing is used in making some types of saltwater lures. This is a good lure for bluefish, as well as other saltwater game fish. The tubing may be from 12 to 18 inches long and have two or three hooks spaced up and down its length. The tubing resembles an eel or a similar saltwater creature.

This assignment only introduced you to fishing lures. In order to learn more about lures, you will need to write lure manufacturers for catalogues and talk to salespeople who sell to your store. Best of all, you can learn a lot about lures just by going fishing.

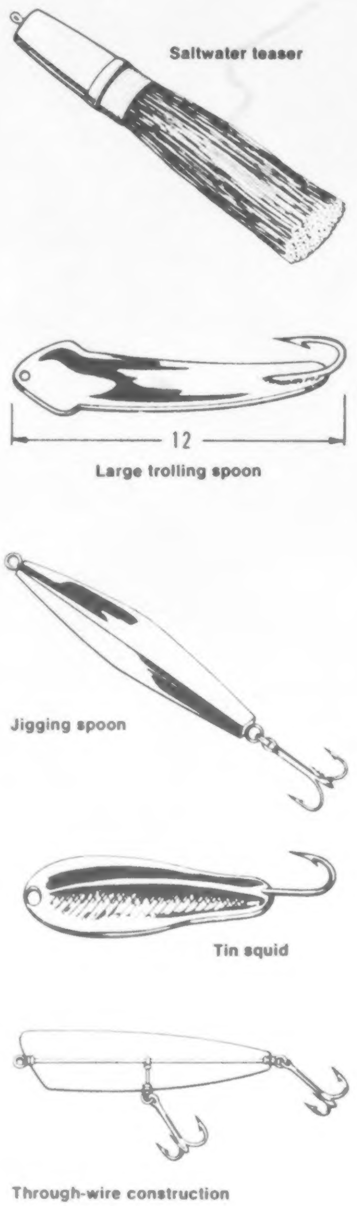


Fig. 7.15. *Saltwater Lures (Courtesy AFTMA)*

Questions

1. How is the word *sport* defined when one is talking about fishing?
2. Give two reasons that fish strike lures.
3. What did most early lures try to imitate?
4. Where did *spinners* first originate?
5. Of what material were *plugs* first made?
6. When is a good time to fish with dark-colored lures?
7. How far under the water's surface are *shallow-running plugs* designed to run?
8. Define a *fishing spoon.*
9. Name the parts of a *spinner lure.*
10. Describe how an angler gives action to a *jig.*
11. Which two types of lures are combined to form a *spinner bait?*
12. If a revolution ever occurred in the field of fishing lures, when was it?
13. Tell which related merchandise should always be suggested to an angler who buys a package of plastic worms.
14. What may flies imitate in addition to flying insects?
15. Define a *nymph fly.*

Projects

1. Write letters to each lure manufacturer your store buys lures from. Ask for catalogues that contain descriptions of the lures and tables that describe lure colors and patterns. You should also ask for information on the manufacturing process, paint used on lures, materials used in their construction, and new products that will be available within the next year.
2. Fill a bathtub, large aquarium, or other container with water. Tie a line to several lures and pull them through the water. On your report, write the name of the lure and then describe its action. You may indicate what animal or fish the action imitates.

8

Terminal Tackle

Objectives: *After completing this assignment, you will be able to—*

1. *define the term* ***terminal tackle;***
2. *tell what "forging" a hook means;*
3. *state the purpose and the disadvantage of the design of the hollow point and the curved-in point found on some fishhooks;*
4. *state the purpose of the design of the barbless hook;*
5. *state the purpose of an offset point on a fishhook;*
6. *explain what is meant by the "gap" of a hook;*
7. *define the "bite" of a hook;*
8. *cite the reason that experts recommend a short-shanked hook for general use;*
9. *tell when hooks with turned-up or turned-down eyes are used most effectively;*
10. *state the purpose of a weedguard on a hook;*
11. *tell how the hook is measured;*
12. *cite the purpose of using a swivel and state the objection that some experienced anglers have to using them;*
13. *cite one of the major purposes of a leader;*
14. *state why clasp sinkers are so popular with anglers;*
15. *tell why split shot is called by that name; and*
16. *state two purposes for using a float.*

The word *terminal* means "the end." A bus trip ends at a bus terminal, for example. In fishing tackle, terminal tackle is placed at the end of the line. This tackle includes hooks, swivels, leaders, sinkers, and floats. Some people become so interested in the rod, reel, and line that they do not give proper consideration to terminal tackle. This can be a great mistake.

You should remember that the terminal tackle actually comes into contact with the fish and must withstand the shock of a strike from a heavy fish. Terminal tackle must also be able to stand up to the strain placed on it during the angler's fight to land the fish. With a weak hook, swivel, or leader, a good fish can get away, making a fishing trip less enjoyable than it should be. An angler who insists on buying the top-of-the-line rod, reel, and line, but who depends on the cheapest hooks he or she can find, is practicing poor judgment.

Sometimes the problem is not using "cheap" equipment. It could be that the wrong hook or snap was selected for a particular type of fishing. The result can still be the same.

This assignment provides you with information about various types of terminal equipment. Remember that terminal tackle is merchandise that sells well. Your customer will certainly need terminal tackle and should be given an opportunity to buy while still in your tackle store. If a sale is made, you help your customer, your store, and yourself by becoming a more valuable salesperson in your store.

Hooks

The fishing hook actually evolved from a device called a *gorge,* a small stick sharpened on both ends. Early anglers tied a line to the center of the gorge and laid the string along it, parallel to the gorge. The gorge and string were covered with a bait and thrown into the water.

Once a fish took the bait, the string was jerked sharply. If everything went as planned, the string pulled out of the bait and jerked the gorge into a crosswise position in the mouth of the fish. The sharp points lodged in the fish's mouth, and the fish was unable to spit out the gorge. The fish was then pulled in with the string.

With the discovery of metals, fishhooks were first produced. Bronze fishhooks were used in Crete as early as 3,400 B.C. London, England, is considered to be the location where modern hook manufacturing really began. Another European city noted for hook manufacturing is Oslo, Norway.

Modern hooks are machine made. A piece of steel wire is cut and sharpened on both ends. The wire is then cut in the middle, and both pieces of sharpened wire are shaped into the desired type of hook by a machine. The barb is cut and the eye is formed during this process. Since the wire is still soft at this point, it must be tempered.

The tempering heat treatment hardens the hook. Some hooks are tempered to bend before breaking. Others are very hard and will not bend. The hook is then *scored* to remove any scale that resulted from the tempering process. Finally, the hook is *plated*. If the hook is to be used for strong fish, it is then hammered or *forged*. This causes the hook to have a flat appearance. Forging the hook increases its strength by about 20 percent.

A fishing hook has several parts. Figure 8.1 shows these various parts. The following section describes each part of the hook. Selecting a hook involves more than just reaching for whatever is in the tackle box. The type of fish the angler hopes to catch will largely determine the selection of hooks.

Points and Barbs

Several types of points have been developed for fishhooks (see fig. 8.2). Each point is designed to do a specific job and has its strengths and weaknesses. It is impossible to make one point that includes all the advantages of the many types of points available.

A *hollow-point* hook has a straight barb on top, but the underside of the point is hollowed out. The *curved-in point* is slightly curved toward the shank. Both of these points are long and thin and are designed for quick penetration. The main disadvantage of both types is that the point is somewhat fragile and may bend or break.

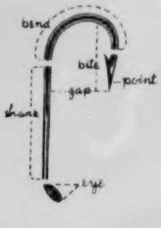


***Fig. 8.1.** Parts of a Hook*
(Courtesy Outdoor Life *magazine, April, 1980)*

Manufacturers vary the basic parts to make thousands of hook styles.

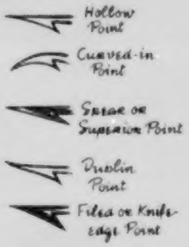


***Fig. 8.2.** Barbs and Points*
(Courtesy Outdoor Life*, April, 1980)*

The *spear point* is easily manufactured and is the least expensive point made. The barb is slightly longer than that of the hollow point or curved point. This point will not penetrate as quickly as the other two, but it is stronger.

The *dublin point* is another long, slender point that quickly penetrates. It has a slight outward rise just at the tip and is very sharp.

The *knife-edge* point is a high-quality point. The four sides of the point are ground for sharpness. The barb is flat and wider than average. This makes it harder for the fish to throw the hook. This point is strong and penetrates quickly because of its special construction. It is often found on hooks used for saltwater big game fish.

Barbless hooks are designed to protect fish that are to be released. These hooks lack barbs that catch in the flesh of the fish. Some barbless hooks have a slight bend in the wire which may help to hold, but does not damage, the fish. It is easier for the fish to throw the hook, but the chances of injuring the fish during the fight or when releasing it are much less. Some states restrict certain waters to catch-and-release fishing. Barbless hooks are almost always required when fishing in these waters. Fewer fish are lost when barbless hooks are used than one might expect.

The Point Position

The point position refers to the location of the point in relation to the position of the shank of the hook. For this discussion, visualize a fishhook that you are holding upside down. You are holding the eye of the hook between your thumb and forefinger. The bend of the hook is toward you so that the point of the hook is closer to you than the shank of the hook.

A *straight point* is parallel to the shank of the hook (see fig. 8.3). If you are holding the hook as described above, the point will align with the shank as you look at it. It does not curve to one side or the other. This point is considered best for hardmouth fish, since the point aligns with the pull of the line during the strike.

There are three variations of the straight point. The bend of the *rolled-in point* is angled in toward the shank. This is considered a good point when baitfishing for saltwater fish.

The *bent-in point* has the spear of the point aimed more directly toward the shank. This type of point has the disadvantage of a smaller gap, but it is hard to throw once it penetrates the fish's mouth.

The third variation is the *bent-out point*. This point is bent at a slight angle away from the shank of the hook, giving the hook a larger bite.

A *kirbed point* is *offset*, that is, not lined up with the shank. If you hold the hook upside down, you will see that the bend curves first to the right of the shank. It then curves to the left, and the point of the hook is offset to the left of the shank.

A *reversed point* is just the opposite of the kirbed point. In this point, the point's tip is offset to the right of the line of the shank.

Hooks with offset points often spin when the angler strikes and sharply pulls the line. As the hook turns in the fish's mouth, it has a better chance of striking a place it can quickly penetrate.

The barb of a hook is the spur that keeps the hook from coming out of the fish's flesh once it is embedded. A short barb quickly penetrates the flesh and allows the hook to hold the fish. A long barb does not penetrate as quickly, but it holds better than a short barb.

A short barb is usually better for fish, like crappies, with paper-thin membranes about the mouth. A long barb makes a bigger hole in the membrane and sometimes enables the hook to pull out. A long barb is preferred for fish that jump a lot, since a hook is often thrown during the jump.

How Sharp Is the Hook?

Most anglers make the mistake of assuming that a new hook is sharp enough. This is not true. Hooks are mass-produced, and it is impossible for every hook to leave the factory as sharp as it should be. The point seems to be very sharp, but it is always best to resharpen hooks with a hone, whetstone, or file. This takes only seconds but can help prevent the loss of a fish.

Hooks should be sharpened periodically during a day of fishing. Every time your hook catches a fish or hits a rock, stump, limb, or lily pad, it loses some sharpness. A periodic touch with a hone will keep the point sharp and greatly increase the chances of hook penetration when a strike occurs.

The Gap of the Hook

The *gap* is the distance between the tip of the point and the shank of the hook. If a fish has a relatively small mouth, like a carp, a hook with a small gap should be used. A bass has a larger mouth and can easily accommodate a hook with a wide gap. The wide-gap hook is also useful for fish with long snouts, such as pike, pickerel, muskie, or gar fish.

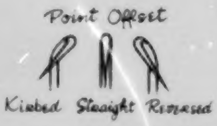


Fig. 8.3. *Point Positions*
(Courtesy Outdoor Life, *April, 1980)*

One note of caution: A hook with a wide gap is likely to be weaker than a hook with a narrow gap.

The Bite of the Hook

The *bite* of the hook is the distance from the bend to the tip of the point of the hook. This is the distance that the hook can be driven into the fish's flesh. A hook with a larger bite can penetrate deeper into the fish and will hold better during a fight.

The Shank of the Hook

The *shank* of a hook is the straight part that runs from the eye to the bend of the hook. Most experts recommend using hooks with shorter shanks, unless there is a need for a longer shank. This is because a long shank provides more leverage for the fish to work against the bend and point of the hook. During a fight with a strong fish, it is possible that a long-shanked hook will break at the bend or the point may be pulled out of the fish's flesh. Short-shanked hooks are also preferred when the angler is trying to hide the hook in the bait.

Used appropriately, long-shanked hooks are good when angling for sharp-toothed fish. The longer shank reduces the chances that the fish will bite the line or leader. A long-shanked hook may also be preferred for small-mouthed fish or for fish that often swallow the bait before being hooked. The long-shanked hook can be more easily removed from the fish's mouth. Long-shanked hooks are also necessary when tying bucktail or streamer flies.

A shank is not always straight. A bend may be put in the shank to assist in holding bait or in lure construction. Some plastic worm hooks have bends in the shank which makes the worm appear more natural as it is retrieved. The bend in the shank may also be designed to change the impact of the point during a strike. They may cause the hook to rotate for better penetration.

A point to remember is that, if two hooks are identical in all other respects, the hook with the shorter shank will be the strongest.

When describing the length of the shank of a hook, any deviation from the standard length is designated by a "long" or "short" notation. Following this notation is a symbol of 1x through 5x. A long (L) 1x notation means that the shank is as long as the next hook size, but the bend and the gap are of standard size. An L 3x notation means that the shank is as long as a standard shank on a hook that is three sizes larger.

The Eye of the Hook

The *eye* is that part of the hook that the line or leader ties onto. Several types are used.

In the *needle eye,* the shank is flattened at the end, and an eye, like that of a needle, is placed in the flattened part. This type eye is very strong. It is also convenient when rigging a bait for trolling, since the eye is no wider than the shank and easily penetrates the bait.

The *ball eye* is round, and the diameter of the wire is the same throughout its full circle. The ball eye is usually tempered, so it will not open. Some hooks are made of wire that is soft enough to permit the eye to be opened and closed. If the eye is reopened and closed, it stands a good chance of breaking and, therefore, is usually found only on hooks of lower quality.

A *tapered eye* is much like a ball eye. The main difference is that the wire that forms the eye is uneven in diameter. As the wire nears the end of the circle, it begins to taper. Where the circle closes, the wire is very thin.

The *braised eye* is one of the stronger types of hook eyes. In this eye, the gap between the end of the wire circle and the shank is braised shut. This increases the strength of the eye and also protects the line from the sharp edge of the gap.

The Position of the Eye of the Hook

The eye of the hook is usually in one of three positions. Each position describes the location of the eye in relation to the shank of the hook.

The *ringed eye* is the normal position. Here, the eye sits straight up on the end of the shank. Both the bottom and top of the eye are directly above the end of the shank.

The *turned-up eye* is angled back from the line of the shank. This means that the eye angles in a direction opposite from the side of the shank on which the point is located. A turned-up eye is often desirable on a hook that has a short shank. It is positioned so that it does not interfere with hooking action during a strike.

The *turned-down eye* angles toward the point of the hook. A snelled hook (hook with short leader attached) with a turned-down eye and a curved or hollow point has an excellent chance of penetration during a strike.

Hooks with turned-up or turned-down eyes are considered to be more effective when snelled than when tied directly to the line.

Nontypical Hooks

There are several hooks available that are designed for a special purpose or have been rigged to be more convenient for the angler.

Bait Holders. A bait holder is a device or adaptation that helps the hook to hold bait more securely. One of the more elaborate bait holders is a *bait coil.* This is a coil of wire that spirals up the shank of the hook. Dough bait, cheese, or most other soft baits can be molded onto the hook and held more securely with the bait coil. This is found most often on treble hooks.

Slices in the shank are used to help hold baits on single hooks. On these hooks, a shallow slice is made in the shank and a piece of metal is raised from the shank. The slice of metal acts like a barb to prevent the bait from slipping down on the hook. This is a good way to keep worms from bunching up on the hook.

A *ryder hook* is used with some long-shanked hooks. This hook is small and is attached to the shank just below the eye of the hook. The larger point is placed in the bait at one location, and the ryder hook punctures the bait at a different location. This type of arrangement can be used with small fish, frogs, or other bait that look more natural if hooked in this manner.

Weedguards. A weedguard is a metal or plastic strip designed to keep the point of the hook from sticking into brush, grass, or weeds as it is pulled through the water (see fig. 8.4). The guard is usually attached to the hook just below the eye. It then extends to a place just in front of the point of the hook. It is often slightly curved to enable the point of the hook to slide up and over any obstacle it might encounter.

Slight pressure against the weedguard does not usually expose the point of the hook. The force of a strike is usually enough to push the guard down and to allow the point of the hook to hit the fish.

Weedless hooks are helpful, but they are not foolproof. A weedless hook will sometimes snag. Also the weedguard will occasionally interfere with the strike, resulting in the loss of a fish. However, many anglers feel that weedguards prevent enough snags to justify an occasional snag or lost fish.

Snelled Hooks. A snelled hook has a single- or double-stranded leader that has been tied to it by a machine. The leader is tied to the shank at a point just below the eye of the hook. The leader then runs through the eye, which is usually either turned up or turned down. The snell consists of several loops of the leader around the shank of the hook. The upper end of the leader has a loop that can be attached to the line running from the reel or the pole.

Treble Hooks. A treble hook consists of three hooks with a common eye (fig. 8.5). These hooks increase the chances of penetration when a fish strikes. They are usually found on lures, but are sometimes used on trotlines and, less often, for rod-and-reel fishing. Some anglers use very large treble hooks to snag rough fish. These hooks are used without bait and are tied to very heavy lines. As the angler feels a fish brush the line or hook, the hook is jerked sharply, in an effort to strike the fish. This practice is illegal in some areas.

How Hooks Are Measured

A hook is measured by the size of the gap of the hook. This is the only standard measurement in hooks. Hooks become smaller as their assigned number becomes larger. A size 10 hook, for example, is much smaller than a size 3 hook. As hooks become larger than a size 1 hook, the size is written 1/0, 2/0, 3/0, and so on. As the first number increases, the size of the hook increases. A 5/0 hook is much larger than a 1/0 hook, for example. Figure 8.6 shows how hooks of standard length vary in size according to number.

The subject of hooks is much broader than most people realize, and there are many things to learn. As a tackle salesperson, you will first need to know about the hooks used in your

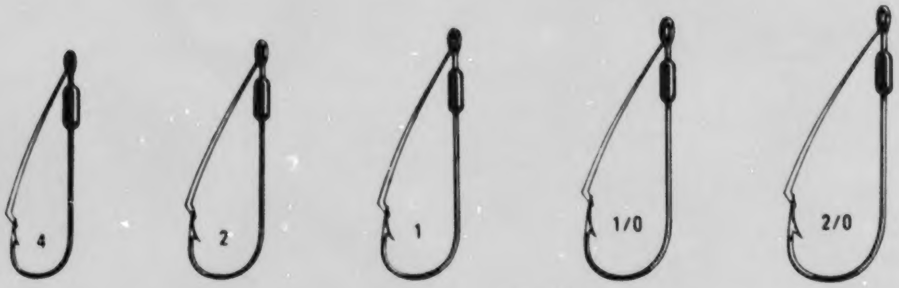


Fig. 8.4. *Weedless Hooks*
(Courtesy Wright and McGill Company, 1979 Fishing Tackle Catalogue, *Denver)*

No.	*Finish*	*Sizes*	*Description*
349W	Gold Plated	4 2 1/0 2/0	*Aberdeen, Light Wire, Weedless—These hooks have a special temper. They will bend before breaking and can be reshaped. Light wire does not injure minnows.*

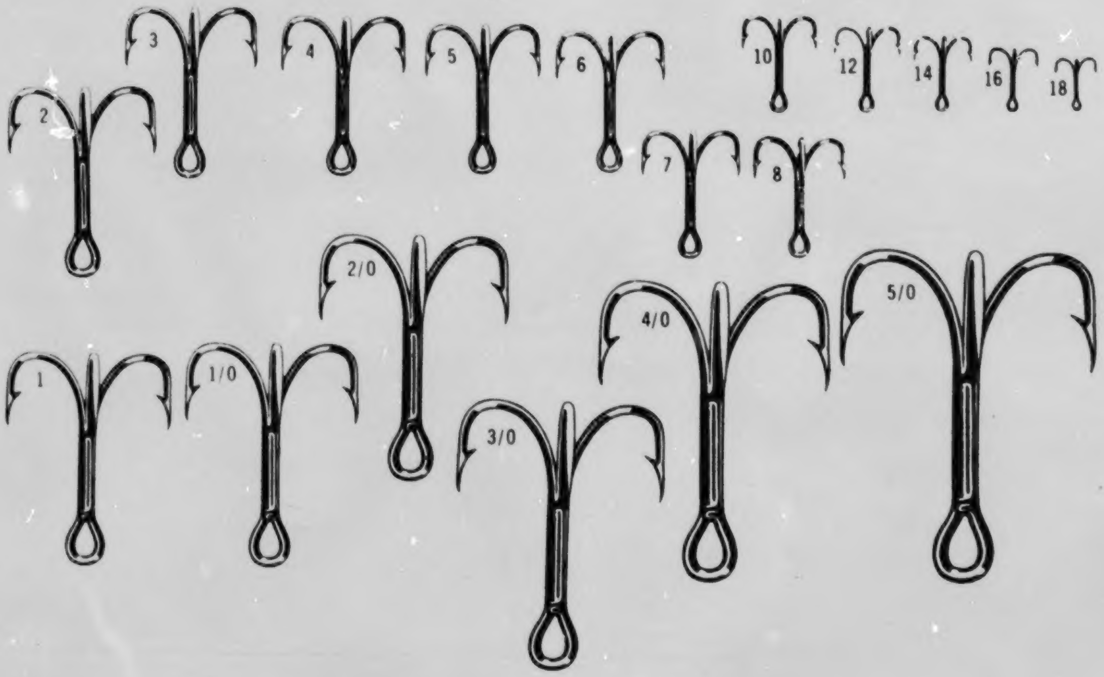


Fig. 8.5. *Treble Hooks*
(Courtesy Wright and McGill Company, 1979 Fishing Tackle Catalogue, *Denver)*

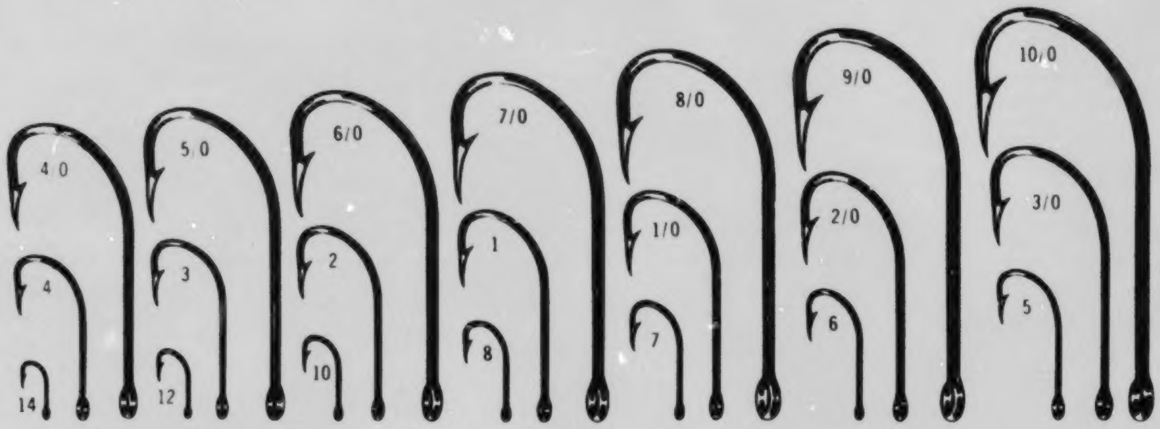


Fig. 8.6. *Hook Sizes*
(Courtesy Wright and McGill Company, 1979 Fishing Tackle Catalogue, *Denver)*

immediate area. Once you do that, you will need to continue your "hook education" if you are to be a master tackle salesperson.

Swivels and Snaps

A *swivel* is a device used to prevent line twist. Twisted line can be caused by a trolled bait, by a spinning lure or spoon, or by reel action. It can cause problems and should be avoided when possible.

Some swivels are used in constructing fishing rigs. A triple swivel may have one eye connected to the main line, another eye connected to a line with a sinker, and the third eye connected to a line terminating in the hook. Finally, a snap swivel may be used as a convenience in changing lures.

A swivel usually consists of two eyes that are connected by a rotating device. There are several types of swivels, but they can be divided into two basic groups.

Slider Swivels

Slider swivels depend on several connections between loose-fitting pieces of metal to allow rotation to occur and to prevent line twist.

The Barrel Swivel. This is the most common type of swivel and probably the least effective. It consists of two twisted wire eyes that are connected by a loose-fitting metal housing called a barrel. Each metal eye is free-turning (see fig. 8.7).

The Crane Swivel. This barrel swivel does not have twisted wire eyes. The crane swivel is considered to be superior to the barrel swivel.

The Box Swivel. This swivel is similar to a barrel swivel, but the eyes are connected to a rectangular piece of metal, rather than to a barrel. Since the swivel housing is open, the swivel can be lubricated to enable proper functioning.

Bead Chain Swivel. This swivel consists of a series of stainless steel beads connected by short shafts of stainless steel wire. This swivel is relatively efficient in preventing line twist.

Bearing Swivels

Bearing swivels are considered to be superior to slider swivels (see fig. 8.8). They have a ball bearing mechanism that helps them rotate more easily. They are more expensive but are more likely to perform the function expected of a swivel. Two types of effective bearing swivels are the offshore swivel and the sampo swivel.

Three-Way Swivels

Some swivels have three eyes and are called three-way swivels (fig. 8.9). They do a good job of keeping the rigging in order, but the angler should not depend too heavily upon their ability to prevent line twist. Of the swivels

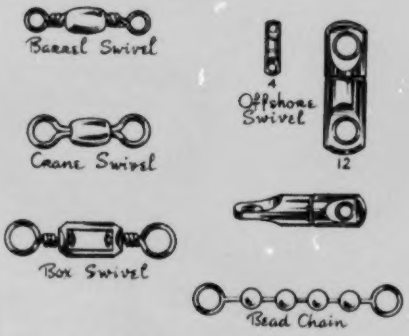


Fig. 8.7. Slider Swivels (Courtesy Outdoor Life, April, 1980)

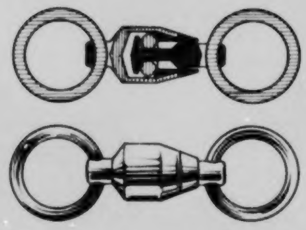


Fig. 8.8. Bearing Swivels (Courtesy Outdoor Life, April, 1980)

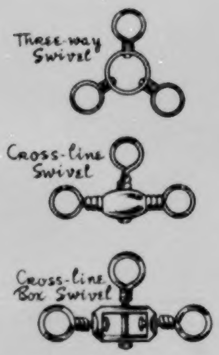


Fig. 8.9. Three-way Swivels (Courtesy Outdoor Life, April, 1980)

shown in figure 8.9, only one is truly a three-way swivel. The others are cross-line swivels that form a T-shaped rig when a line is attached to each eye.

The angler should recognize that swivels do not always rotate. Some are just poorly constructed, some are not well-designed, and others become corroded and do not rotate. Some experienced anglers recommend that swivels not be used unless a severe line twist is likely to occur. They contend that a swivel adds weight, visibility, and drag to a terminal rig without guaranteeing that line twist will be avoided.

Snaps

A snap is a piece of connecting wire used to attach the hook to the line. Unlike the swivel, the snap has no rotating device, but works much like a safety pin (see fig. 8.10). It can be used with a swivel or alone. A snap offers some convenience to the angler but, like the swivel, is often an unnecessary piece of equipment. Some anglers feel it is better to take time to tie knots than to depend on a snap, generally considered to be the weakest link in a terminal rig. Care should be exercised in selecting snaps, and only those of good quality should be used.

Most snaps are made of stainless steel or a coated carbon steel. Two-piece snaps usually have a brass body. The wire of a snap should retain its shape and should not break after opening and closing several times. A larger brass snap must be used to equal the strength of a smaller steel snap. Several types of snaps are manufactured, and some of these are described in the following section.

The Interlock Snap. This is a very popular snap with a wide bend. It does not greatly reduce lure action and has a more secure lockup system than a snap lock.

The Snap Lock. This is also a popular snap and probably the most widely used. It is found on many snap-swivel combinations. Its action resembles that of a safety pin, and it is relatively easy to handle. This is considered to be a fairly weak lockup system, however. The shape of the snap greatly reduces lure action.

The Coast Lock Snap. This is a very strong snap that is not likely to open during a fight with a heavy fish. The shape of the bend somewhat restricts lure action, and this snap will sometimes break if opened too wide.

Fly Clips. These are very tiny clips or snaps that are also very light. They can even be used with a dry fly and not cause it to sink. These clips are a convenience to the fly caster who does not wish to tie a knot every time a new fly is used.

Customers should be advised that a hook should not be directly attached to a snap, but rather to the line. It's all right for a snelled hook to be attached to a snap.

Leaders

Assignment 6, on fishing lines, included a section on leaders. Therefore, leaders are not discussed in great detail in this assignment, even though they fall into the category of terminal tackle. One of the major purposes of leaders is to provide an invisible connection between the lure and the line. This is especially important when a braided line is used. The use of leaders has declined since the arrival of monofilament line, which is as invisible in the water as a leader. Since most leaders are made of monofilament and since most spinning, spin-casting, and bait-casting reels are now equipped with monofilament line, it is not necessary to use leaders anymore. They are now mostly used by anglers who fish with fly equipment, and by those who plan to hook sharp-toothed fish with sharp gill covers or rough scales.

Sinkers

A sinker is used to take the bait down to a desired depth at a desired location in the water. The sinker may do one of three things, depending on its design. It may hold the bait at that location, or it may allow the bait to move about on the bottom, pushed by the current. Finally, the sinker may keep the bait or lure near the bottom as it is retrieved.

Sinkers are designed specifically for the special job they are to perform. For this reason, a variety of types of sinkers can be found (fig. 8.11). Most of these are made of lead, a metal that is easily melted and molded and is very heavy for its volume. It is also malleable, which means that it can be bent without easily breaking. This is a handy characteristic for split shot and some other sinkers. This section introduces you to several sinkers used in fresh and salt water.

Worm Sinkers

Plastic worm fishing revolutionized many parts of the fishing tackle industry, and sinker manufacturers were also affected. A new, conical-shaped sinker was developed for plastic worm fishing. These sinkers can be very short or fairly long. They have a hole through

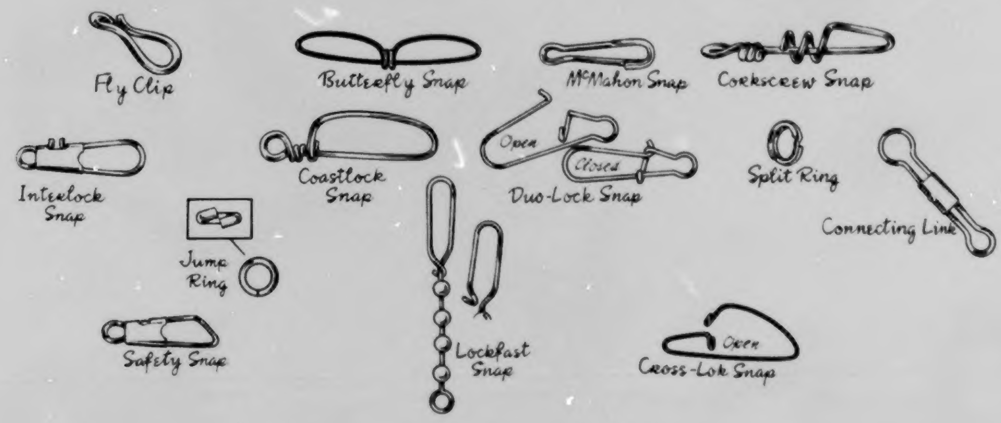


Fig. 8.10. Snaps
(Courtesy Outdoor Life, April, 1980)

the center, running from the nose to the base of the cone. These sinkers come in many sizes to suit the size of the lure and the depth of the water being fished.

The worm sinker rides on the line just in front of the worm. The base of the cone is next to the worm's head and the nose of the cone is pointed toward the rod tip. The sinker takes the worm to the desired depth and helps to activate the worm as it is retrieved with a lift-and-drop motion. A Texas-style worm rig, with the sliding worm sinker, is about as weedless as any worm rig made.

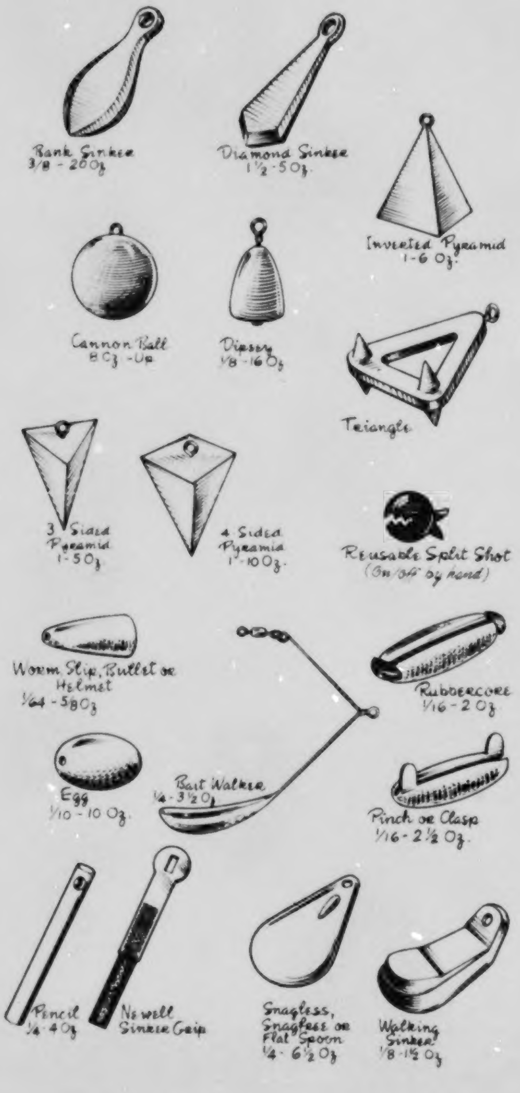

Bank Sinker
3/8 - 20 Oz
Diamond Sinker
1½ - 5 Oz.
Inverted Pyramid
1-6 Oz.
Cannon Ball
8 Oz - Up
Dipsey
1/8 - 16 Oz
Triangle
3 Sided Pyramid
1-5 Oz
4 Sided Pyramid
1-10 Oz.
Reusable Split Shot
(On/off by hand)
Worm Slip, Bullet or Helmet
1/64 - 5/8 Oz
Rubbercore
1/16 - 2 Oz
Egg
1/10 - 10 Oz.
Bait Walker
1/4 - 3½ Oz
Pinch or Clasp
1/16 - 2½ Oz.
Pencil
1/4 - 4 Oz
Newell
Sinker Grip
Snagless,
Snagfree or
Flat Spoon
1/4 - 6½ Oz
Walking
Sinker
1/8 - 1½ Oz

Fig. 8.11. All Types of Sinkers
(Courtesy Outdoor Life, April, 1980)

Another type of worm sinker is molded onto a hook. Similar to a jig, the worm is placed on the hook. This weight does not slide along the line as will the worm sinker described above. Some of these hook-and-sinker combinations have weedguards to prevent snags during the retrieve.

General-Purpose Sinkers

Several types of sinkers are used throughout the country in almost all types of fishing situations. They are referred to as general-purpose sinkers.

The Dipsey Sinker. This is one of the most popular of all sinkers with anglers who fish with bait. It is a piece of bell-shaped lead with a wire eye at the top end of the bell. This sinker comes in many sizes and ranges from as small as ⅛ ounce to 20 ounces. It is used in fresh and salt water.

The Clasp Sinker. This is also a very popular sinker with anglers who fish with bait. It is shaped like a hotdog bun, split from one end to the other on one side. The split one goes about halfway through the body of the sinker and, at each end, on opposite sides of the split, is an "ear" of metal. The line is placed in the split of the sinker, and the ears are then pressed down over the line to hold the sinker in place and to keep it from sliding.

This sinker (see fig. 8.12) may range in size from 1/16 ounce to 2½ ounces. One reason this sinker is so popular is that it is easily added to and removed from a fishing rig. It is not necessary to cut the line or to remove hooks to add or remove this sinker. Sinkers can be added to the line until the desired weight is reached, if the proper-sized sinker is not available.

A variation of the clasp sinker is the rubber core sinker. It is shaped like a clasp sinker and has about the same size or weight range. One big difference is that the rubber core sinker does not have the lead ears. Inside the split is a piece of rubber, at each end of which is an ear that sticks out past the end of the split. The line is placed in the split or groove in the sinker and is then placed behind each of the rubber ears.

This secures the sinker to the line and prevents its sliding up and down.

Split Shot. The split shot sinker gets its name from the fact that it looks like a piece of lead buckshot from a shotgun shell. Split shot are round pieces of lead that are split half in two. The line is placed in the split, and the shot is mashed down on the line. If the lead is soft enough, this is not difficult and the shot is very secure.

The best split shot sinkers have teeth in the split that help to hold the line. They also have ears on the opposite side of the split that enable the angler to open the buckshot once it has been closed. This feature is shown in figure 8.11.

Other Sinkers. Some other general-purpose sinkers include the cannonball, the diamond, and the inverted pyramid sinkers. These are heavy-duty sinkers that range up to several ounces in weight. See figure 8.11.

Sinkers for Fishing in Strong Currents

There is a great difference between fishing in a lake of still water and fishing in a river or the ocean with heavy currents. Special sinkers are needed to quickly take the bait to the bottom. Once there, the sinker must be able to maintain its position and not be tumbled along by the current. Except for the inverted pyramid, most of the general-purpose sinkers are easily moved by a heavy current, unless they are extremely heavy.

The Disk Sinker. This sinker does a good job of burrowing into a sandy bottom. Its main disadvantage is its flat shape. During the cast, it is easily blown off course by the wind and may not go exactly where the angler intends. Once it enters the water, a strong current can easily move this sinker until it finally reaches the bottom. It may come to rest at a point several feet from where it entered the water.

The Pyramid Sinker. This is the most popular type of surf and heavy-current sinker. It casts very well and quickly sinks to the bottom. It comes in two shapes, three-sided and four-sided, which causes it to resist tumbling. The three-sided sinker is considered to hold its position on the bottom better than the four-sided sinker.

The Grapnel Sinker. This sinker is a piece of lead shaped like a fat nose cone on a rocket. A long wire sticks out of the lead body, at the end of which is an eye. In addition, four or five other pieces of wire stick out of the lead body. These pieces of wire easily stick into a sandy or muddy bottom and help the sinker to keep its position.

Sinkers for Drift Fishing

Some sinkers are designed to take the bait to the bottom and then to allow the bait to explore the water there. The line is run through a hole in the sinker, but is not usually tied to it. Once the rig is at the bottom, the angler provides enough slack line to allow the current to carry the bait along. Some sinkers are designed to be relatively stationary as the bait explores the bottom. Others will be moved along by the current but do not tumble along like some general-purpose sinkers do.

The Egg Sinker. This has been a long-time favorite for drifting baits along the bottom and probably is more subject to pressure from the current than many of the other drift sinkers.

The Walking Sinker. This is a relatively new sinker that was developed in the Upper Midwest for walleye fishing. The Mississippi River and other rivers in that area have very strong

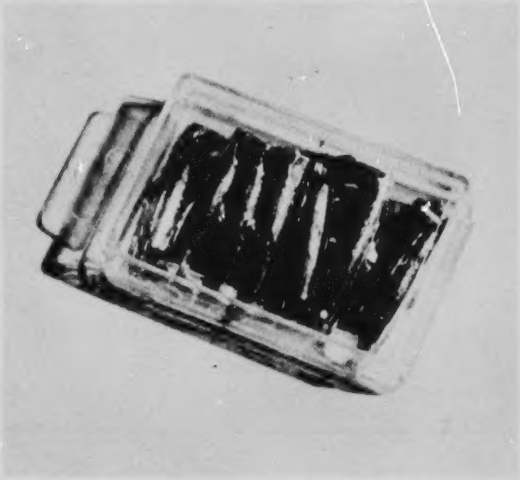


Fig. 8.12. Clasp Sinker
(Courtesy Oshman's Sporting Goods, Austin, Texas)

currents. The walking sinker has been found to be good for keeping the bait near the bottom, where walleye are usually found. This sinker is now marketed throughout the country and is not limited just to walleye fishing.

The Pencil Sinker. This is a slender metal rod with a hole in one end. It is popular with anglers in the western part of the country. It is used largely in streams that have fast currents and rocky bottoms.

The Bait Walker Sinker. This sinker is a piece of Y-shaped wire, with a banana-shaped piece of lead at the end of one of the arms and a swivel attached to the other end. An eye is placed at the base of the Y. This sinker allows the bait to be suspended just off the bottom of a stream or river.

Trolling Sinkers

Trolling sinkers serve more than one purpose. First, they take the bait to the desired depth and keep it there. Most sinkers also have a keel to help the trolling rig run in a straight line. This is important when several spinners or other attractors are being used to draw fish to the bait or lure. This apparatus may not move in a straight line unless the trolling sinker is used. The sinker may also allow the spinners to do their job without causing the bait or the lure to spin.

Some trolling sinkers have specially designed surfaces or "wings" called "planes." These are designed so that, as the trolling rig begins moving through the water, the pressure against the plane forces the sinker deeper into the water. This gives the sinker the advantage of design plus weight as it takes the rig to the desired depth.

The following advice is helpful to pass along to customers who are new to fishing. A sinker should be heavy enough to do its job, but not so heavy that it interferes with successful fishing. A weight that is too heavy is difficult to cast. It also is likely to warn the fish that something is wrong with the bait it has just taken in its mouth. The lightest possible sinker should be used, and it should be rigged so that it is least likely to warn a fish of danger.

Floats

A float is an important part of many baitfishing rigs. One purpose of the float is to keep the bait at the desired depth. This is very important when fishing for some species of fish. For example, if you catch a crappie while fishing at a depth of 6 feet, you are likely to catch another crappie if the bait is again placed 6 feet deep. Crappie travel in schools, and where one is found, several more are nearby. This fish tends to stay at its depth and usually will not rise even a foot or two to take a bait.

So the bait must be at the fish's depth to be effective. The float enables the angler to keep the bait at the right depth. Some baits, like crayfish and hellgrammites, try to hide if they reach bottom. A float can be used to keep the bait off the bottom and visible to the fish.

Another purpose of the float is to let the angler know when a fish nibbles or takes the bait. This is an exciting part of baitfishing. The angler can watch the float bob up and down and move about as the fish prepares to run with the bait. When the float goes under, the angler strikes the fish. Some fish can take bait off the hook without pulling the float under. When these fish are about, the angler must strike when the float first begins to move.

A float should be just big enough to remain afloat after the terminal rig reaches its depth. This will cause it to be sensitive to any interest that a fish may show in the bait. When a fish strikes, the float should go under with a little resistance.

Manufacturers produce many types of floats. The following section contains information about several types of floats used throughout the country. Refer to figure 8.13 as you read.

Connecting the Float to the Line

Floats are usually made of hard plastic, cork, balsa, or foam. Many floats have a hole running through their centers from top to bottom. A slender stick fits into the hole. To secure the float to the line, the angler runs the line through the hole until the hook is at the desired distance from the float. The stick is then inserted into the float, wedging against the line, which keeps the line from slipping.

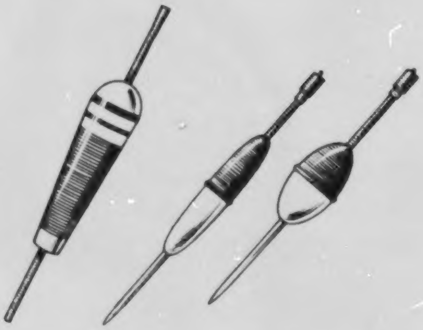
Some floats have a thin slit in one side that goes to the hole in the center of the float. The line is placed in the slit and pulled to the hole in the center. The depth of the hook is adjusted, and the stick is then inserted into the hole to secure the float to the line. This system makes it possible to remove the float without removing the hook, sinker, and other terminal tackle.

Other floats have a clip at each end of the stick that is inserted through the center of the float. The line clips to the stick, and it is not necessary to run it through the hole in the float. Some sticks have only one clip located at the bottom.

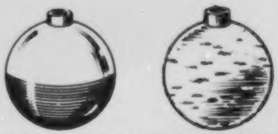
All of these systems work. It is more convenient not to have to run the line through the float. This makes it easier to add or remove a float. On the other hand, the line through the hole in the center is more secure, if the rig is to be cast any great distance.

Types of Floats

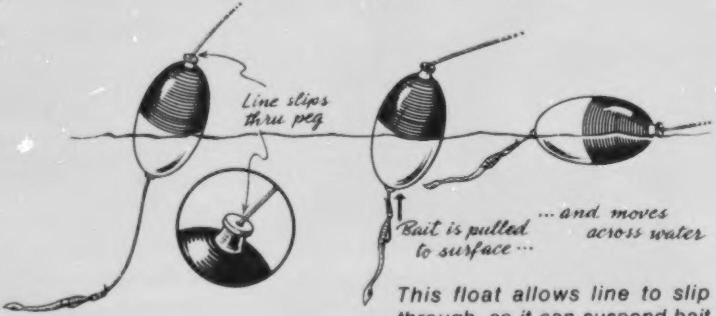
Round Floats. Round floats (see fig. 8.14) are usually made of cork, plastic, or foam. The hard plastic type is probably most popular. Round floats are ball-shaped and have a good deal of surface on the top of the water. For that reason, they are not as easily pulled under water as are slender floats. A soft strike is not as quickly signaled to the angler when a round float is used.



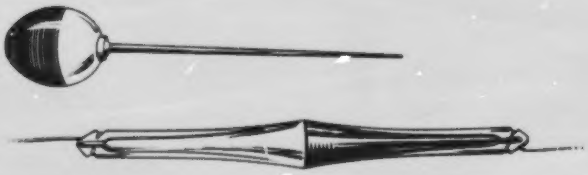
Slender types, the most sensitive of all, work well for all panfish species.



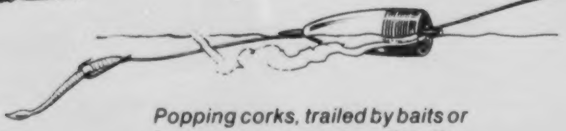
Plastic, or cork, round bobbers are the worst at signaling a strike.



This float allows line to slip through, so it can suspend bait just off the bottom in deep water.



Long, slender bobbers are sensitive enough to show the slightest nibble.



Popping corks, trailed by baits or lures, are great attracting devices.

Fig. 8.13. Floats
(Courtesy Outdoor Life, *April, 1980*)

Most hard plastic floats have two clips attached to a spring mechanism located inside the body. The line is attached to the two clips, and the float is easily added to or removed from the line. This float comes in many sizes and colors. Probably more round floats are sold than all other types combined.

Slender Floats. Slender floats are most often made of cork or foam. Most use the hole-and-stick method for securing the float to the line. These floats are very sensitive to a nibble or a strike and are considered good for all panfish.

Most slender floats sit upright in the water. The strike is signaled as the float goes under or moves sideways in the water. Some slender floats are designed to lie flat on the surface. When a nibble occurs, one end of the float will stand up, and a strike will usually pull the float under.

A very slender float is the *quill float.* This is usually a real quill, a piece of the wing feather from a large bird like a turkey. This float is so slender that it will signal the slightest nibble. It is considered to be good for carp and other fish that bite very gently or that mouth the bait before making a run.

Pear-shaped and oblong-shaped floats are a compromise between the round and the slender float. They usually are not very sensitive to nibbles and strikes.

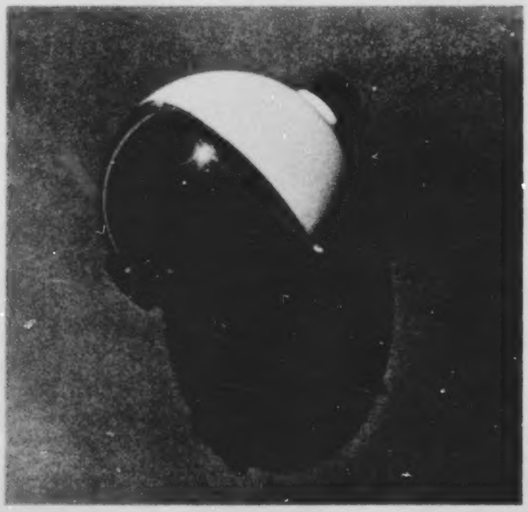


Fig. 8.14. *Plastic Bobber Float*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

Sliding Floats. Some anglers need to cast the bait a good distance in order to reach a favorite location. This is hard to do if the float is attached to the line at any great distance from the hook. When four or five feet of line extend past the tip of the rod, trying to cast a rig is a difficult task. As the length of the line past the rod tip increases, the accuracy of the cast usually decreases.

For this situation, the angler needs a sliding float rig. This enables the float to slide down near the end of the rig so it can be cast more easily. After the cast, the float slides up the line until it is stopped at the proper place. This is done by placing a "float stopper" on the line. A small length of rubber band can be tied to the line to serve this purpose. The float stopper must be small enough to go through the guides of the rod as the angler casts the rig. When a fish is hooked, the float slides back down to the end of the line as line is retrieved.

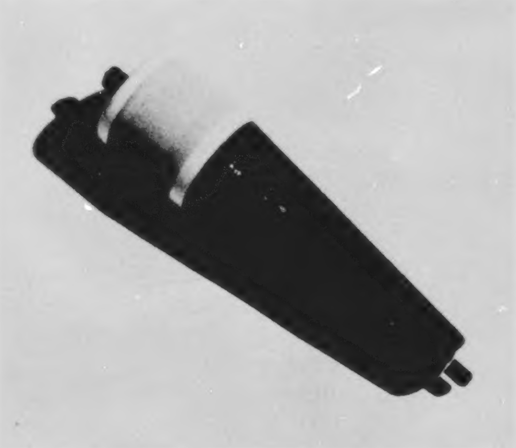


Fig. 8.15. *Popping Cork*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

Popping Corks. A popping cork (see fig. 8.15) is used to attract game fish to a bait. This type of float is used on the Gulf Coast to attract speckled trout. Variations of this float are used to attract game fish in other waters.

The cork is usually larger than the average float, and the body is often at least 6 inches long.

The line runs through a hole in the cork, and a stick secures the cork to the line. The top of the cork has a concave shape, similar to a chugger topwater lure. The rig is cast out and retrieved with strong jerks which causes the water to gurgle and splash.

Game fish will often investigate a commotion on the water. When a fish investigates the disturbance caused by a popping cork, the angler hopes that the fish will see and strike at the bait. A popping cork can also be used above a jig or weighted fly.

Subsurface Floats. Small floats are sometimes tied to the leader. These floats are light enough to be taken under water by the weight of the sinker, but they still help to keep the bait at a desired distance from the bottom.

Floats are often considered an aid to beginning anglers, which is not entirely accurate. Many experienced anglers prefer to use a "tight line" while baitfishing. They enjoy feeling the strike through the rod or through the line held between their fingers. Many other experienced anglers still prefer to use floats. They enjoy the thrill of watching floats bob and go under and the convenience of keeping the bait at the desired depth.

Questions

1. Define the phrase *terminal tackle.*
2. Where did modern hook manufacturing begin?
3. What happens when a hook is *forged?*
4. Cite the purpose of the design of hollow-point and curved-in point hooks and the main disadvantage of these hooks.
5. State the purpose of the design of the *barbless hook.*
6. Cite the purpose of an *offset point* on a fishhook.
7. Define the *gap* of a hook.
8. Define the *bite* of a hook.
9. Why do most experts recommend using a *short-shanked hook?*
10. Why is a *braised eye* considered to be one of the stronger types of hook eyes?
11. State the most effective way to use hooks with turned-up or turned-down eyes.
12. What is a *weedguard* on a hook?
13. Tell how a hook is measured.
14. What is the reason for using a *swivel*?
15. Why do some experienced anglers not use swivels?
16. Cite one of the major purposes of the *leader.*
17. Name the metal from which most sinkers are constructed.
18. Describe why a *clasp sinker* is so popular with anglers.
19. Why are *split shot* sinkers called by that name?
20. Name two purposes for using a *float.*
21. From what substance is a *quill float* made?

Projects

1. Report to your class on the history and development of the fish hook.

2. Conduct an experiment to see which swivels are best at reducing line twist. Tie several 5-foot pieces of monofilament line to a stationary pipe. Tie a swivel to the end of each piece of string, using various types of swivels. Attach a lure to each swivel. Rotate each lure 100 times, and then check the lines to see which type of swivel was best at reducing line twist.

3. Conduct an experiment to see which snaps are strongest. Tie several pieces of wire or very heavy line to an overhead bar or pipe. Attach various types of clips to the pieces of string. Tie a wire to the loop of each clip, and add weight to the wire until each clip fails. Record the weight at which each clip failed.

9

Fishing Accessories

***Objectives:** After completing this assignment, you will be able to—*

1. *describe the type of handles on the better tackle boxes;*
2. *give the name of the first type of specialized tackle box;*
3. *cite one of the greatest advantages of the cotton or nylon stringer;*
4. *state the disadvantages of the metal minnow bucket;*
5. *state the biggest advantage of the foam minnow bucket;*
6. *name the materials from which the better landing nets are made;*
7. *tell when a gaff should be used to land a fish;*
8. *state another name for depth finders;*
9. *state what the pH reading of a sample of water tells the angler;*
10. *describe the major characteristic of a truly waterproof rainsuit; and*
11. *tell what the angler can do to help prevent chest waders from filling with water if he or she falls while wading.*

Fishing accessories include merchandise that is not considered to be fishing tackle but which makes fishing easier, more comfortable, or safer. The lines of accessories will vary from store to store. Most tackle shops stock the basic accessories, such as stringers and minnow buckets. Only the full-line stores are likely to stock waders or electronic equipment. This assignment introduces you to some of the fishing accessories you will need to become familiar with as a tackle salesperson.

Tackle Boxes

A tackle box is practically a necessity in fishing. You will probably agree with this idea, if you have ever tried to carry hooks, lures, sinkers, floats, and other terminal tackle in your pocket. A tackle box enables the angler to carry everything necessary for a day's fishing.

Tackle boxes should be of rugged construction to withstand the hard treatment they receive. They are often exposed to sunlight, moisture, gasoline, and other chemicals. They are also subjected to bouncing around in the trunk of a car or riding in a boat as it is pulled to the lake. The shell of the tackle box should be made of some high-impact material. Steel, hard plastic, fiberglass, and aluminum are most often used.

The corners of the box should be rounded. Locks and hinges on better boxes are made of brass or stainless steel rather than plastic. The handles of better tackle boxes are constructed so the box cannot be opened while the handles are being held. This prevents lures and everything else from spilling out of the box is unlatched. This is one of the best features to mention when selling a tackle box.

The trays inside the tackle box are usually made of plastic, but some are aluminum. These trays should be rigid with strong hinges. The trays should always be lined up to fold down properly when the tackle box is closed. Some boxes have only one tray. Larger boxes usually have several trays and may store over 50 lures. The storage area should be large enough to accommodate extra reels, line, lures, fly or plastic worm boxes, tools, lubricants, stringers, and other necessary equipment.

Tackle boxes come in several styles and sizes (see fig. 9.1). The smaller ones usually have a single lid with one tray mounted on parallel hinges. As the lid is pulled back, the tray may also be lifted back to expose the storage area in the bottom of the box. A larger tackle box may have a single lid and two or three trays. The largest boxes usually have two lids that latch together when closed. When opened, several trays may be found on each side of the box. When the lids are fully opened, the trays are arranged in a stairstep position on each side of the box, and the storage area is exposed.

One evident trend in the tackle box industry is specialized tackle boxes. One of the first of these was developed for plastic worms in the late 1960s. This was a small plastic box treated to withstand the chemicals in plastic worms that corroded most tackle boxes made during that time. The box had three or four dividers for storing worms of different colors or sizes.

Since then, other specialized boxes have been made for plastic worms, spinner baits, crank baits, and others. Small divided boxes for flies were manufactured many years before the plastic worm box. The worm box, however, was the forerunner of most of the newer types of specialized tackle boxes. Some of these are designed to be carried in the storage area of a large standard tackle box. Most, however, are too large for this and are carried separately. Some now provide compartments for some types of terminal tackle and are not limited only to the purpose of storing lures.

A key feature to look for and to point out to customers is the fact that the tackle box is "wormproof." Most plastic lures contain chemicals that will corrode untreated metal and plastic boxes. The least that will happen is that the paint or finish will corrode and the lure will stick to the box. Most manufacturers now make their boxes "wormproof," so they are not damaged if a plastic lure is left in contact with the box for an extended period of time.

A tackle box is a good suggestion selling item. This is especially true if it is obvious that a parent is buying a son or daughter a first fishing rig. Other good opportunities exist during sales or with teenagers who are beginning to build an "adult" fishing rig after having fished with a simple rig for several years. This is one of those times that knowing your customers will help you sell more effectively.

Stringers and Creels

Fish stringers come in two basic types. The first and simplest type is a very good stringer. It is a cotton or nylon cord with a ring at one end and a stringing tip at the other. The sharp stringing tip is inserted into the lip or through the gills of the first fish that is caught. It is then run through

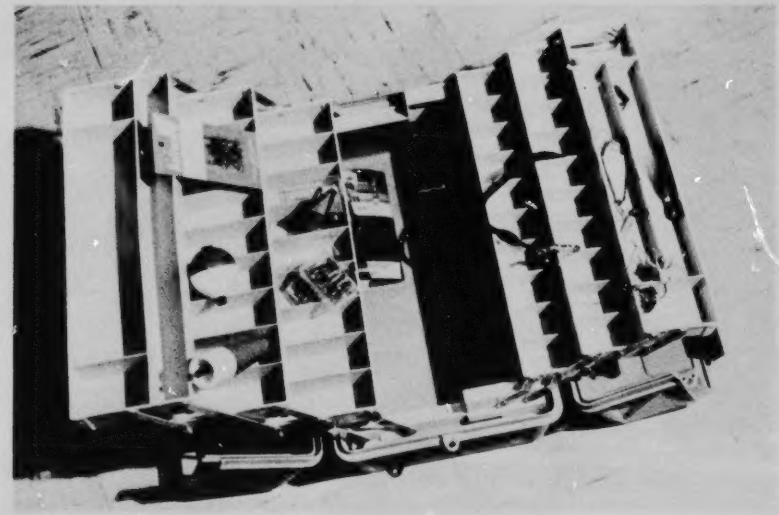


Fig. 9.1. Tackle Box
(Courtesy Oshman's Sporting Goods, Austin, Texas)

the ring, and the loop is pulled down to hold the fish at the end of the stringer..

As other fish are caught, the stringer tip is inserted through the lip or gills. The fish then slides down the stringer until it is stopped at the end by the last fish placed on the stringer. The customer should know that stringing the fish through the gills will often cause the fish to die. This is especially true if the stringer becomes crowded.

The cotton or nylon stringer will keep fish alive for a long time if they are strung through the lips. One of the biggest advantages of this stringer is that it is quiet and does not rattle against the boat as a fish is placed on the stringer. Many anglers who fish for easily frightened species of fish strongly prefer this stringer.

The other type is a chain stringer with several wire snaps (see fig. 9.2). The chain holds the stringer together. Eight or ten wire snaps are attached, and each snap latches like a safety pin. When a fish is caught, the sharp piece of wire is inserted into the fish's lip and then is snapped back into the latch. This stringer will handle average-sized fish.

Many anglers will not place a trophy fish on a chain stringer. Some trophy fish have been lost because a strong fish can sometimes spring the wire out of the latch. If this happens, the fish easily slides free. If a trophy fish is caught and only a chain stringer is available, two snaps should be used to hold the fish. A chain stringer should be made of a noncorrosive metal. The latches should be strong, and the stringer should be long enough to be used by an angler fishing from the shore of a lake or the bank of a stream.

Some who fish for trout use a *creel* instead of a stringer. This is a box that attaches to the belt or that hangs from a shoulder strap. A classic creel is made of woven strips of willow wood; others are of canvas. The creel is lined with moss or dry grass which is used to keep the fish from touching each other. The creel allows air to circulate around the fish to help keep them cool. Fish can be safely kept in a creel for three or four hours.

Bait Boxes and Buckets

Most anglers who bait fish must carry bait from one location to another. Some catch their own bait. They dig worms, seine (net) minnows and crayfish, or catch hellgrammites, crickets, grasshoppers, and other insects. Other anglers buy their bait at bait stands. In both cases, anglers must use something to carry the bait to the lake or river.

It is not too difficult to carry some kinds of live bait. Worms, crickets, and other oxygen-breathing baits will usually live for awhile, as long as they are not allowed to get too hot or cold. Minnows, shrimp, and other water creatures are harder to keep alive. Not only must the water be kept at the right temperature, but it may need to be changed to ensure that there is enough oxygen to keep the bait alive.

Minnow Buckets

A minnow bucket is used mainly to carry minnows, shrimp, and crayfish from one place to another. Crayfish should not be forced to stay in deep water for too long. Shrimp and minnows will quickly use up the oxygen in the water, and the water must be changed often or the bait will die.

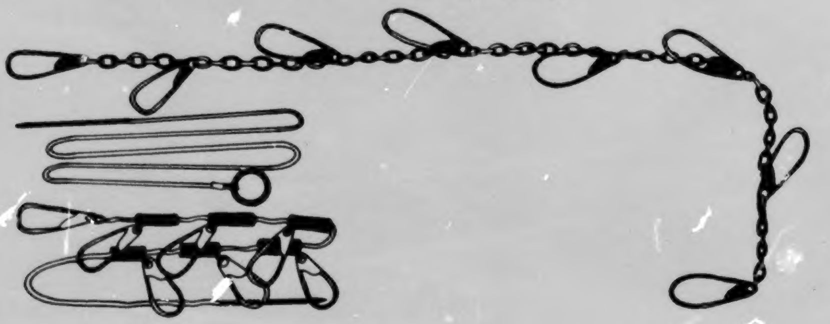


Fig. 9.2. Stringers (chain, cord, or plastic) keep fish alive and fresh.

Metal Minnow Buckets. Most metal minnow buckets consist of two buckets, one inside the other. The outside bucket has a handle. The inside bucket, about the same size as the outside bucket, has many small holes in it. It has a small lid at the top for extracting and replacing minnows (see fig. 9.3).

When bait is placed in the outer bucket that is filled with water, the water pours through the many small holes. The inside bucket then sinks to the bottom of the outer bucket. When fishing from the shore or from a boat, the inner bucket can be placed separately into the lake or river. Fresh water then circulates through the holes to keep the bait alive.

The metal minnow bucket is the classic type and is widely used. The main disadvantage of this bucket is that bait will quickly die if the water is not changed often. The metal bucket may also cause noise problems if the angler is fishing from a boat. The inside piece may bang against the boat as a new minnow is taken from the bucket. On the other hand, this minnow bucket is sturdy and will last for many years.

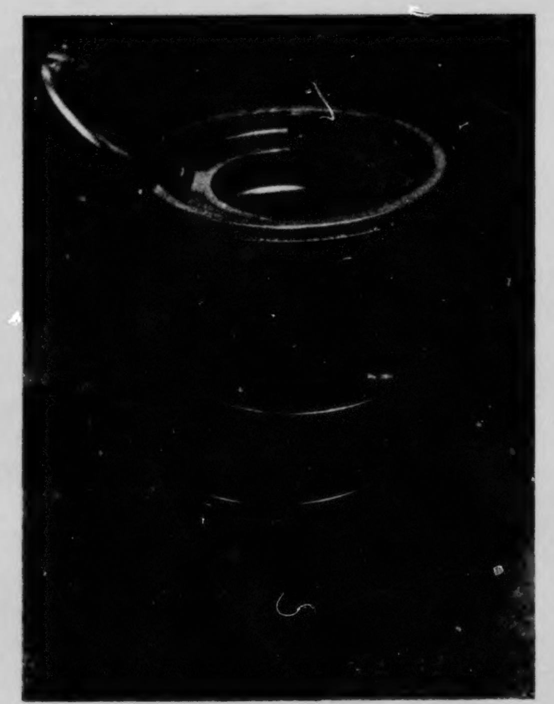


Fig. 9.3. Metal (galvanized) minnow bucket (Courtesy Montgomery Ward, Austin, Texas)

Foam Minnow Buckets. Another type of minnow bucket is made of foam, a synthetic product that offers many advantages. The biggest advantage is that most of these buckets "breathe." This means that oxygen can enter the water through the walls of the bucket. This improves the oxygen content of the water and helps to keep bait alive for a longer time.

These buckets are widely used and convenient, since they do not have to be placed in the water. They can be kept handy for the angler inside the boat or on the shore. If properly cared for, these buckets will last quite awhile. They are not as durable as metal buckets, however.

It is now possible to buy minnow buckets that are equipped with pumps called aerators. As the air bubbles from these pumps rise to the surface, some of the oxygen is absorbed into the water. Use of aerated minnow buckets helps to keep minnows or shrimp alive much longer than normally possible.

Bait Boxes

Several types of bait boxes exist. Boxes used for crickets often have screened sides. A small lid allows the angler to take a cricket out of the box without the others escaping. Some bait boxes in the form of jars may be used. These sometimes have a stick or pedestal inside. When the lid is opened, the angler will usually find a cricket perched on the end of the stick.

Other bait boxes are for worms, frogs, and other bait. These are often made of foam. As with the minnow bucket, the foam allows oxygen to pass through the walls of the box. The foam is also a good insulator and keeps the bait from being strongly affected by hot or cold outside temperatures. The inside of the box is often filled with sphagnum moss, the same substance that some commercial worm growers place in their worm boxes.

Landing Nets and Gaffs

Sometimes fishers can land a fish by lifting it into the boat or onto the bank with the rod and line. Other fishers use their hands to catch the fish in the mouth or gills and to lift it into the boat. These methods of landing fish have been used, but at times they are unsatisfactory.

If an angler brings a northern pike up to the boat, it is unlikely that he or she will try to grab the fish by the lower lip. Other fish also have sharp teeth or gill plates, and this discourages landing the fish by hand. To try to lift a 6-pound bass into the boat with the rod and line can be a big mistake. The fish may flip off the lure or the line could possibly break. During times like this, a net or a gaff can be a handy piece of equipment.

The Landing Net

A landing net usually consists of an aluminum frame with a wide-mouth net attached to it (see fig. 9.4). The mesh varies but is usually about 1-inch mesh. This means that there is an inch between strings in the net.

Many fishers consider the net to be a necessary piece of equipment and use it to land all but the smallest fish. Many fish will allow themselves to be pulled to the boat. Then, a fish that seems to be exhausted will often try to run as it is lifted from the water. Many fish are lost this way.

A net is either slipped under the fish or the fish is led into the mouth of the net. It is then suddenly raised and the fish is scooped out of the water. Few fish are lost once they are actually in the net.

Boat nets are large and usually have long handles. Wading nets are used by fly fishers, tube fishers, and others. These nets are much smaller and have short handles.

The better nets are made of nylon or other synthetic fiber. Nylon is very durable and strong and is not as likely to rot as a cotton net. A good net will float if dropped into the water. The net may have a rubber handle and a wrist loop to ensure against dropping it.

The Gaff

A gaff is a large hook connected to a pole or handle. It does not have a barb, and is used to

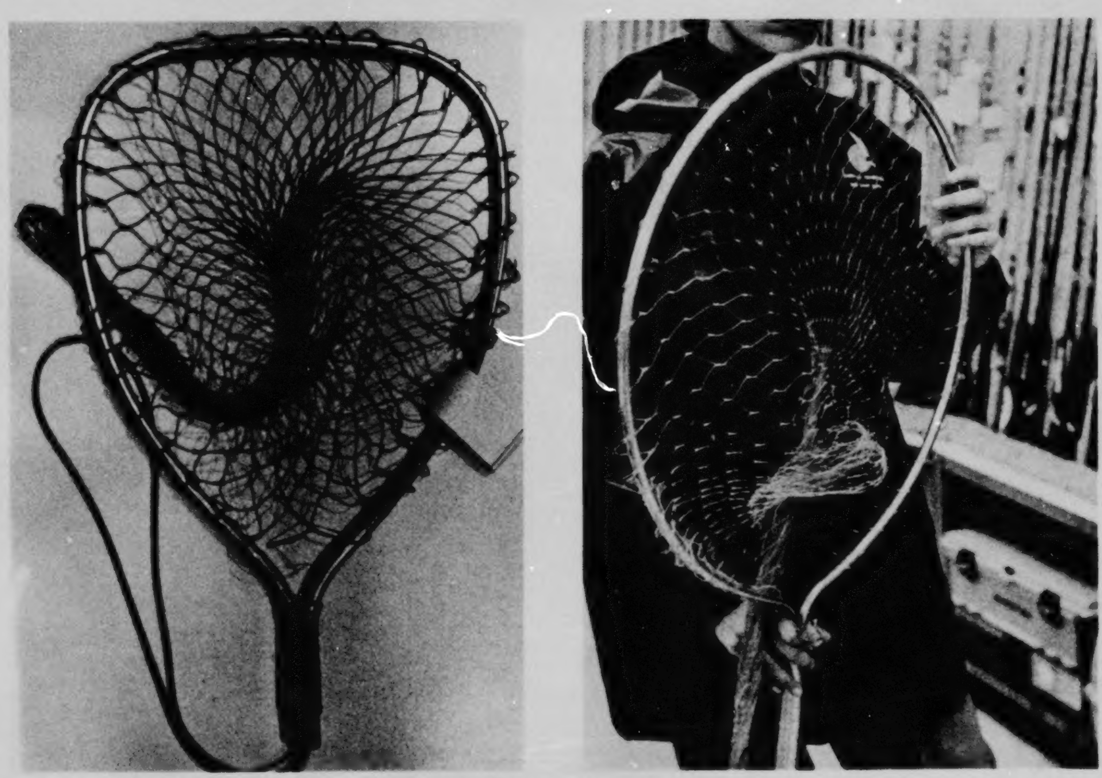


Fig. 9.4. Two Types of Landing Nets
(Courtesy Oshman's and Ward's, Austin, Texas)

land fish that are too large or dangerous to net. Most saltwater game fish over 10 pounds are gaffed when brought aboard a boat. The gaff hook is positioned under the fish and then is quickly raised so the hook penetrates the belly of the fish.

This often takes the fight out of a fish and makes it easier to handle once it is on board. Some trotline anglers keep gaffs aboard their boats. When a large catfish is hooked on a trotline, it is hard for one person to "boat" the fish safely. The gaff can be used to help bring the fish aboard.

Depth Finders

This electronic device is used to find the depth of the water. Many models also can be used to find fish if the angler knows how to read the scope. In fact, depth finders are sometimes called *fish locators.* The depth finder uses sonar to "read" the bottom of a lake, river, or ocean (see fig. 9.5).

A small device called a transducer sends high-frequency sound waves through the water. When the sound waves bounce back, they give information about the water's depth and also about the type of bottom. This information is indicated on the dial by a constantly flashing light.

Depth finders can help anglers find underwater structures. *Structure* refers to places that are different from a smooth bottom. Fish are often found nearby. Favorite structures that can be located by a depth finder include creek or river channels, high spots like underwater islands, submerged trees, old ponds and tank dams, dropoffs, and rocks.

A person fishing in a bay often looks for a "hole," an area where the water is deeper than normal. A hole will usually have several fish. Even a small hole only a few yards in diameter can be productive.

Depth finders are rather expensive. The tackle salesperson needs to understand how they work if a customer is to be satisfied with the sales presentation.

Thermometers

The temperature of the water is an important factor in fishing. Fish generally become more active as the water warms up. If the water becomes too warm, the fish seek more comfortable locations in the water. The most productive temperature range is 50 to 75 degrees Fahrenheit.

An electronic thermometer enables the angler to determine the depth at which game fish are most likely to be found. The thermometer has a probe that is weighted. When the probe is lowered, the temperature of the water is instantly flashed on the dial. An angler can then see how deep a lure or bait must go to enter water that has a temperature of less than 75 degrees. This depth will vary from lake to lake, and the electronic thermometer can be a very useful accessory.

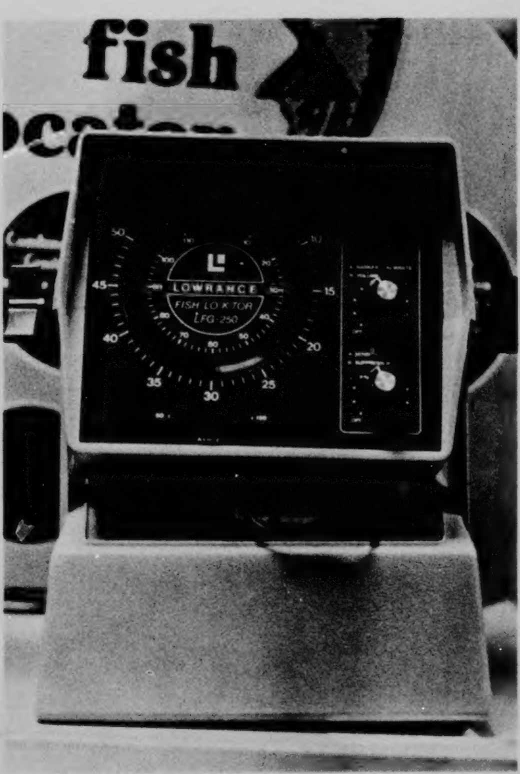


Fig. 9.5. *Depth Finder*
(Courtesy Montgomery Ward, Austin, Texas)

pH Test Kits

The "pH" reading of a sample of water tells the angler the level of acidity or alkalinity of the water. Fish will seek water that has a pH level consistent with their tolerance level. For example, bass prefer a pH level of from 7.5 to 7.9, although they can live in water with a range of 6.7 to 9.6. Seven parts per million is considered neutral.

The pH reading may vary from time to time, depending on wind and wave action and rainfall. The type of soil around a lake and the soil through which feeder streams run also affect a lake's pH reading. Test kits for pH use water samples to determine the acidity of the water.

Other Accessories

Several other accessories can be very useful to an angler. These are briefly reviewed in the next section.

Pliers

If you looked into the tackle boxes of several experienced anglers, it's likely you'd find a variety of types of pliers. Some anglers use a regular pair of adjustable pliers. Others use needle-nose pliers with a wire cutter edge. Still others have pliers with nipper jaws that can handle heavy pieces of metal. Some tackle boxes might contain pliers with broad jaws designed to hold a fish while a hook is being extracted. Anyone who has ever tried to unhook a catfish can appreciate a pair of pliers that will hold the fish still. This is especially true if the fish is a saltwater catfish.

Knives

Most anglers carry a pocketknife or have a folding knife in the tackle box. This knife should be strong enough to handle tough jobs and should also resist corrosion. Some fishing knives have a long folding blade, notched at the point, for unhooking a fish that has swallowed the hook. The blade may also have a sawtooth edge on the back of the blade.

Another type is the fillet knife (see fig. 9.6). This knife is usually long, thin-bladed, and very sharp. These knives often come with a sheath that protects the edge and the angler. Many anglers use electric knives to fillet fish. Your tackle shop may carry this appliance.

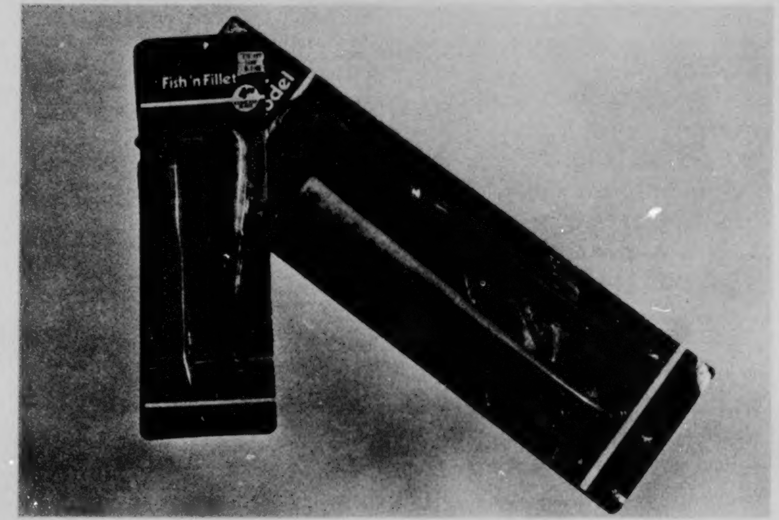


Fig. 9.6. *Fillet Knife*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

Hones and Files

Many anglers recognize the need for sharpening hooks, even those fresh from the factory. A periodic sharpening during the day helps the lure be more effective. Hones and files are used to sharpen hooks. A hone is a long piece of sharpening stone, and a hook-sharpening file is made of steel with very fine teeth.

Rod Cases

Some graphite and boron rods are supersensitive; however, they are also more fragile and require better care. A rod case is a wise purchase for any angler. It protects the angler's rods while they are being stored. It also protects rods while they are being transported from one place to another. Rod cases may be made of aluminum, plastic, or fiberglass. The end of the case should screw or snap onto the case to keep the rods more secure.

Reel Covers

Many anglers leave their reels attached to their rods. This prevents the use of a rod case. Many of these anglers still would like to have something to protect their reels from dust and dirt when they are being stored or transported. A reel cover is just what is needed. This is usually a soft vinyl case that slips over the handle of the rod and the reel. It may be closed with a zipper, drawstrings, or some other device. Reel covers are very popular with a large number of anglers.

First-Aid Kit

It is a good idea to have tape, bandages, gauze, an antiseptic, and other first-aid items handy. Several minor and some major injuries can occur while angling, and a first-aid kit is an important accessory.

Clothing and Footwear

Several accessories fall into the category of clothing and footwear. Among these items are life jackets, rainsuits, insulated overalls, waders, and boots.

Life Jackets

Several types of flotation devices are available to anglers. Some anglers wear no safety devices, and others wear ski belts and other devices that are only marginally safe. Still others wear jackets and vests that ensure safety in case of an accidental fall into the water.

The vests and jackets you sell should all be Coast Guard-approved. To satisfy your own curiosity, you should test them in a local swimming pool. Some safety devices will not keep an angler afloat, or they won't keep the head of an unconscious angler in a safe position out of the water.

The most convenient flotation device is a vest that zips up the front. Some have several pockets that can be used for storing glasses, tackle, or other items.

Rainsuits

A chilling rain can ruin a good day of fishing and can result in a bad cold. Once a person is wet, it is often hard to dry out, especially if the day is cool and damp. Many anglers are learning to carry rainsuits to protect themselves.

A rainsuit consists of pants, a jacket, and a hood. There is a vast difference in quality of rainsuits.

The suit's main purpose is to keep the angler dry. Therefore, the fabric and the seams must be of good quality. A good fabric is one that will withstand from 75 to 100 pounds of water pressure. This is usually adequate to keep the moisture on a wet boat seat from being forced through the fabric when the angler sits down.

Customers should understand that a truly waterproof rainsuit will not allow air to escape through the fabric. This can cause the air inside the suit to become heavy and moist. Use of coated fabrics like a polymer-coated elasticized cotton knit can help to dissipate body moisture.

The hood and neck should be constructed so that water will not enter the rainsuit. The jacket should have a flap behind the buttons or zipper to repel moisture.

Insulated Overalls

Those anglers who pursue the popular sport of ice fishing have learned to dress for the weather. Since anglers in the South are fishing more during the wintertime, they are also learning how to dress for cold weather.

Many wintertime anglers wear insulated overalls, which they pull on over their pants. These overalls usually have a bib and shoulder straps. They are insulated with down or with one of the synthetic insulation fibers. A serious angler who fishes during the wintertime will probably buy insulated overalls.

Waders

Two basic types of waders are manufactured. Both are designed to enable the angler to wade in water that is too deep for regular rubber boots.

Hip Waders. The hip wader (see fig. 9.6) covers the leg from the toe to the hip. These waders have a bootlike foot designed for walking along and in a stream. Hip waders are a favorite accessory for many fly fishers. They can be dangerous if they become filled with water, since the weight of the filled boot is hard to manage. This can be especially dangerous if the angler steps into a deep hole while wading in swift water.

Chest Waders. Chest waders are usually preferred for wading in lakes, large streams, or the surf. This type of wader is also popular with anglers who fish from rubber tubes. The chest wader covers the angler from the toe to the upper chest (see fig. 9.7). This wader can also be dangerous if filled with water.

Most anglers buckle a belt around the upper part of the wader at chest level. This helps to keep water from rushing into the waders if the angler slips or falls. The angler can usually regain his or her footing before too much water enters the wader.

A chest wader will have one of two possible foot designs. The most popular is a soft rubber foot, intended to be worn inside a wading shoe. The second design has a bootlike foot, intended to allow the angler to walk about without additional footwear. Many experienced anglers prefer the stockinglike foot design that is worn inside the wading shoe. Tennis shoes can easily serve as wading shoes.

Waders can last for a long time, if they are cared for properly. Most can be easily mended with a rubber patch, just like an inner tube.

Shoes and Boots

Several types of footwear are used by anglers. Many boat anglers use tennis shoes or other soft rubber-soled shoes when fishing. These are comfortable shoes that don't cause too much noise in the boat. Those who fish the shores of lakes and streams must often wade through shallow water. They may wear rubber pac boots while fishing. These are molded rubber boots that are not affected by mud or water. Most are just rubber, but some are insulated to protect the angler from cold water.

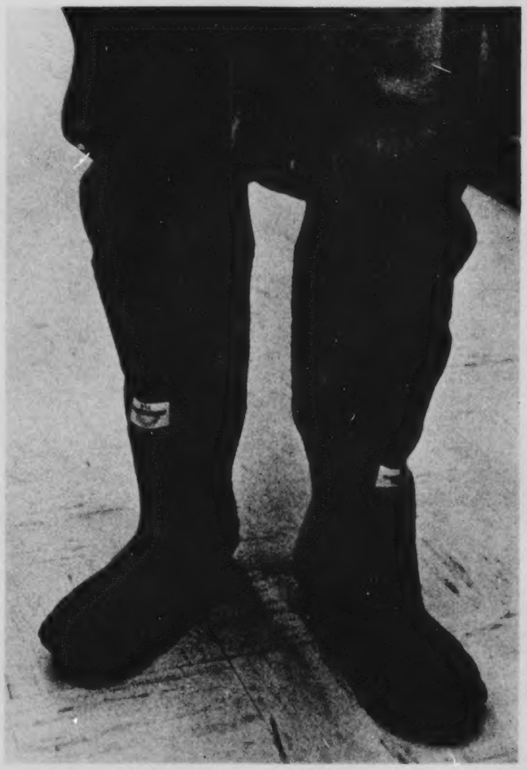


Fig. 9.7. Hip Waders
(Courtesy Oshman's Sporting Goods, Austin, Texas)

Questions

1. What is a good feature to mention about the handles of better tackle boxes?

2. Name one of the early specialized tackle boxes introduced in the late 1960s.

3. Cite one of the biggest advantages of the *cotton* or *nylon stringer*.

4. State the disadvantages of the metal minnow bucket.

5. State the biggest advantage of the foam minnow bucket.

6. Of what material are the better landing nets constructed?

7. Tell when a *gaff* should be used to land a fish.

8. Give another name for *depth finders*.

9. What does a pH reading of a sample of water tell an angler?

10. What should the customer understand about a truly waterproof rainsuit?

11. What can be done to prevent chest waders from filling with water if the angler falls while wading?

Projects

1. Do a report on each of the following:
   - water temperature ranges preferred by the three main game fish in your area
   - pH levels and their effect on game fish

2. Develop a feature-benefit sheet for each of the following:
   - a depth finder
   - a pair of chest waders
   - a large tackle box
   - a life vest

10

The Development of Hunting as an American Sport

Objectives: *After completing this assignment, you should be able to—*

1. *explain why hunting is one of America's oldest and strongest traditions;*
2. *tell why laws that restrict table hunting were passed;*
3. *explain why sport hunting is still a cherished activity of millions of Americans;*
4. *tell how game management programs are financed by many states;*
5. *list or describe hunting club projects that help game birds and animals;*
6. *tell the main objectives of game laws;*
7. *explain why the harvest of game animals is controlled according to the animal's sex; and*
8. *explain why it is illegal to hunt deer at night with a spotlight.*

A person who sells hunting equipment should understand hunters, hunting, and game conservation. This assignment includes information about the background of sport hunting in the United States. It also provides some information about the role hunters play in the conservation of game.

Hunting and Firearms as an American Tradition

Hunting is one of the oldest and strongest American traditions. It was not until the early 1900s, perhaps the 1930s, that hunting ceased to be a necessity for some people in America. Even now, some people depend heavily upon sport hunting to supplement the meat they purchase at the grocery store.

The Early Colonists

The first Europeans to set foot in America found hunting to be a necessary activity. It took about a year for any crops to be grown and harvested. The friendly Indians gave the colonists some food, but not enough to meet all their needs. Each group of colonists had hunters who were responsible for bringing in game. Most men in the colony were hunters at one time or another.

The early colonists also had trouble with unfriendly Indians. This made it necessary for them to be alert at all times. They had rifles or shotguns loaded and ready for use at a moment's notice.

During this and later time periods, the rifle was a normal part of a person's life. Even the meekest person carried a rifle for hunting or protection. It was a necessary tool for most people. A good, dependable rifle was a must. If a rifle misfired when an early-day hunter aimed at a deer, an entire family might go hungry for a few days until another deer was brought home. A misfired rifle during an Indian attack could have meant death. Dependable equipment was very important then, just as it is important now.

The Westward Movement

As Americans moved westward, their guns were just as important as when they lived on the Atlantic Coast. Food was always a concern, and hunting was still an important activity. Indians were still a problem, as new tribes resisted the takeover of their tribal lands. To complicate matters, the French and the Spanish also resisted the westward movement of the English-speaking colonists.

The need to hunt for food, the need for protection from Indians, and the small wars that were continually breaking out made guns a necessity, a part of life. Children became familiar with the use of guns at an early age. Few, if any, questioned the right and the need to have and use guns.

Continued Use of the Gun for Table Hunting

Even after the westward movement, hunting for food continued. There were few game laws in most states until the early 1900s. The food distribution system that we enjoy today had not yet developed. It was not possible to butcher and refrigerate or freeze beef, pork, or lamb for transportation to most points in the United States. And a large part of the rural population maintained the tradition of table hunting on a regular basis.

Small game and game birds were most often hunted. This lasted until the early part of the 1900s. In many rural areas, table hunting was a common practice during the Great Depression of the early to mid-1930s. Game laws began to be passed which strongly limited table hunting. The human population of the country had increased to the point that the game population could not hold up to the pressure of continuous table hunting.

Sport Hunting Replaces Table Hunting

Table hunting is no longer necessary. For most Americans, table hunting is impossible because of the growth of cities. The majority of our nation's population does not have easy access to game, at least not on a daily basis. Table hunting has ceased to exist except in a very few cases. Sport hunting has replaced it.

Sport hunting is an activity cherished by millions of American people, by both men and women. Sport hunting provides a challenge for hunters to seek out and match wits with the types of game that their ancestors hunted strictly for food. Also, it affords them an opportunity to "get back to nature." Most hunters do eat the game that is killed during a hunt. However, the *sport* of the hunt is the most important consideration.

An example will illustrate this point: Your great-great-great grandfather is hunting with his shotgun and sees a covey of quail. It is almost certain that he will try to shoot into the covey while it is bunched together on the ground. By doing this, it is likely that five or six birds will be killed with one shot. The amount of game killed is important if you are table hunting. Today, most sportsmen will wait for the quail to fly. Shooting at a flying bird is much harder than shooting at a sitting bird. This gives the bird a greater chance of getting away. While today's hunter prizes the quail as a food item, the sporting shot is more important.

Today's hunters are becoming more and more sport-minded. They generally wish to give the game (a deer, rabbit, dove, or a duck) a greater chance of escape, so that a kill is more a matter of skill. They know that only a quality rifle or shotgun can enable them to use their shooting skills most effectively. For this reason, hunters are paying more attention to their guns and other hunting equipment.

To be a successful hunting equipment salesperson, you will need to understand this emphasis on quality and dependability. This is an important "need" of most of your customers. You should plan your sales presentations to show that your merchandise meets that need.

Contributions Made by Hunters

Some uninformed people charge that sport hunters are destroying our nation's wildlife. This accusation is not true. Many sport hunters are vitally interested in game preservation and conservation. One answer to give an uninformed person is that there are more deer in the United States today than when the pilgrims first arrived. This is only one game animal that has benefited from the efforts of sport hunters. Sport hunters usually have a strong voice in decisions concerning bag limits, hunting seasons, and the selective harvesting of game.

Uses for Hunting License Fees

Many states finance their game management programs strictly with the money received for hunting licenses from sport hunters. The states use this money for several purposes.

Research. Research into game habitat, food, life cycle, genetic development, and other important areas is sponsored by license fees. This research has led, for example, to more emphasis on harvesting antlerless deer and spike bucks. Research indicates that this is necessary to maintain the quality of a deer herd.

Game Relocation. Several states have benefited from game relocation. This means that, if too many animals are living in one area, some are trapped and moved to less populated areas. This practice has been used with deer, elk, mountain sheep, and other animals. Game relocation can also be practiced with game birds such as turkey and pheasant.

Game Preserves. License money may be used to buy and maintain land where wild game can live and multiply. A preserve may be a safe resting place on a major flyway. Ducks and geese can use these preserves as they fly south during the hunting season.

Game Law Enforcement. Game wardens and support people are needed to enforce game laws. Some people who hunt are not really sport hunters, and they violate bag limits, season dates, and other laws. Game hunters who purchase hunting licenses help support game wardens who help protect the state's wild game.

Organizations for Sport Hunters

Several national, state, and local sports organizations can be found in the United States. Hunters and anglers, interested in helping ensure that sport hunting and sport fishing will continue, join these organizations. One example of a national organization is Ducks Unlimited. This organizations buys marshland for use by ducks and other wild game. It is also involved in the development of laws and regulations that will affect the nation's duck and goose population.

Local hunting clubs have projects to plant trees and brush favored by game animals and birds. These clubs may also plant crops that are not harvested and sold but are left as food for local game.

Emphasis on Keeping the Country Beautiful

Many hunters and anglers take great pride in helping to keep rural and wilderness areas as natural as possible. Most sport hunters and anglers take a dim view of littering, carelessness with fire, and pollution of streams. As members of groups and as individuals, sport hunters and anglers try to leave the wilderness better than they found it. Many carry plastic bags and pick up litter left by campers and others who were not concerned with protecting the wilderness.

Sportsmanship and the Law

Today's hunters are more sport-minded than those of the past. Some sport hunters could be found in early America, but most of the hunting was for food. Seasons and bag limits did not exist. Eventually, some hunters became market hunters. This means that they hunted to supply game to restaurants and clubs.

These hunters seriously damaged duck and geese populations and brought about the near extinction of some game birds. Market hunters used very large guns. They often slipped up on sleeping ducks during the night and killed 30 or 40 with one shot. As sport hunters and others saw the damage being done by market hunters, game laws began to be passed.

Game Laws That Regulate Sport Hunting

Game laws were needed to help conserve our nation's game animals and birds. Laws can be used in several ways to help birds and animals have the best chance of survival. Since market hunters almost destroyed our waterfowl population, laws were necessary to help ducks and geese to become re-established.

Market hunting is now illegal, for the most part. But it still continues in many states. Some people still hunt animals and birds and sell their kill to restaurants or people desiring something different at a special dinner or party. These hunters continue to slow down efforts to develop game herds and flocks.

Game laws must be enforced by game wardens, but they should be strongly supported by sport hunters. Game law violators work against good sport hunting and should be reported.

Game Laws that Regulate Sport Hunting

Several types of game laws exist. Each of these contributes to the development of better sport hunting. Most laws deal with protection of a game animal or bird.

Bag Limits. Most states restrict the number of game birds or animals a hunter can kill in one day. State laws usually restrict the number of birds that can be in the hunter's possession. A dove bag limit might be 10 per day with no more than 20 birds in possession. A deer bag limit might be two deer each season, and one can be an antlerless deer. Bag limits are usually set on a yearly basis, although the same bag limit may be used over a period of years.

Bag limits can be used to control the harvest of game. If a state's deer herd is smaller one year, the bag limit may be lowered. As the herd increases, the bag limit may be increased. Bag limits are not just for the benefit of the hunter. If game biologists see that an overpopulation of a species is developing, bag limits will be increased. This reduces the number of animals that compete for existing food.

Poor range conditions may also cause bag limits to be increased. The animals taken by hunters can be used for food instead of being allowed to starve. The remaining birds and animals have a better chance of survival. It is much better for a deer to be cleanly killed and eaten by a sport hunter than to starve because of herd overpopulation.

Seasons. Most game seasons are established during times that the game is not nesting or caring for young. Most bird seasons occur late enough after a hatch that young birds have enough time to grow into flying birds. During the fall, some young deer will be found with a doe deer, but they are mature enough to graze and get along by themselves.

Game law violators do not pay attention to seasons and kill game anytime it is convenient to do so. This can result in the starvation of young birds still in the nest or young game animals that still depend upon the mother for survival. Sport hunters should support seasons and honor the dates set for hunting each species of game.

Sex of the Animal. The male of the species has always been the most desired trophy. This is true of pheasant, turkey, ducks, deer, and many other game birds and animals. Some animals do not have obvious markings for easy identification of males and females. When this is the case, both are usually taken, and little preference is given to the male.

Laws regulating the sex of game have traditionally made the male of the species the legal game. Game biologists are beginning to change their position on this matter, at least for some game animals. The traditional opinion on deer, for example, has been that one buck deer can meet the reproductive needs of several does. Therefore, it was thought, more bucks can be killed, and the deer herd will still grow.

Now, biologists see that the herd has grown, but the quality of the herd is often low. In order to improve the herd quality, some biologists have decided that bucks need to be given more time to mature. Antlerless deer need to be harvested to reduce overpopulated herds. This thinking has caused some states to give preference to harvesting does and spike bucks so good-quality bucks will not be under such hunting pressure. Skillful manipulation of the harvest of animals, according to sex, can improve the game population.

Caliber and Game. Most states have laws that restrict the types of firearms or weapons that can be used on game animals. This is to reduce the risk of nonfatal injuries to birds and animals. A .22 caliber slug will not likely kill an elk, for example. Such a bullet would probably only injure the animal. The injury could disable the animal or injure it in a way that would lead to a lingering death. For that reason, most states require that guns used for deer and larger game be of a minimum caliber.

Other laws are designed to keep the hunter from having an unfair advantage. A state might have a law against shooting game birds with a small-bore rifle. A good shooter might be able to shoot quail from a point outside shotgun range, if a .22 rifle is used. The sport of this might be questioned since the bullet would ruin most of the meat, unless the bird was killed with a head shot. These laws may seem to restrict hunters unfairly, but they are designed to protect game and the principles of sport hunting (see fig. 10.1).

Unfair Hunting Practices. Unfair hunting practices have made certain gun laws absolutely necessary. One law does not allow a hunter to hunt migratory birds with a gun that can fire over three times without being reloaded. This is to keep a hunter from killing too many birds from one flock at one time. It also is aimed at discouraging market hunters.

Another law restricts hunting certain game animals at night, or with spotlights. Deer, for example, will stand still and stare into a spotlight. This enables a poacher to shoot the deer easily. This is an unfair advantage to the hunter.

Shooting birds on the roost is discouraged by laws that prohibit shooting after sundown, or a set number of minutes before sundown. Morning shooting hours also are aimed at protecting birds on the roost or animals still grazing in fields or pastures. The hunter has enough of an advantage with most game birds and animals, even with seasons, laws concerning the sex of animals, and weapons restrictions. Sport hunters should not try to gain unfair advantage over their game.

Questions

1. How does hunting rank as an American tradition?
2. What were the needs of pioneers during the westward movement that caused the gun to continue to be a necessity?
3. Why were laws passed that restricted table hunting?
4. Why is sport hunting a cherished activity by millions of Americans?
5. How do many states finance their game management programs?
6. What kinds of projects do local hunting clubs sponsor?
7. For what purpose are game laws used?
8. Why do game laws manipulate the harvest of game animals according to their sex?
9. Why was a law passed to prohibit hunting deer at night with a spotlight?

Projects

1. Contact your state's wildlife department for information on the number of hunting licenses sold last year, how much money this brought into the state's treasury, and how the hunting license money was spent. Use this information to develop a report to your instructor.
2. Develop a poster with a picture of each game bird and game animal found in your area. Under each species, write down hunting regulations that apply to that species (bag limits, seasons, and so on).
3. Talk with a local game warden, and write a report on game laws that are most often broken in your area.

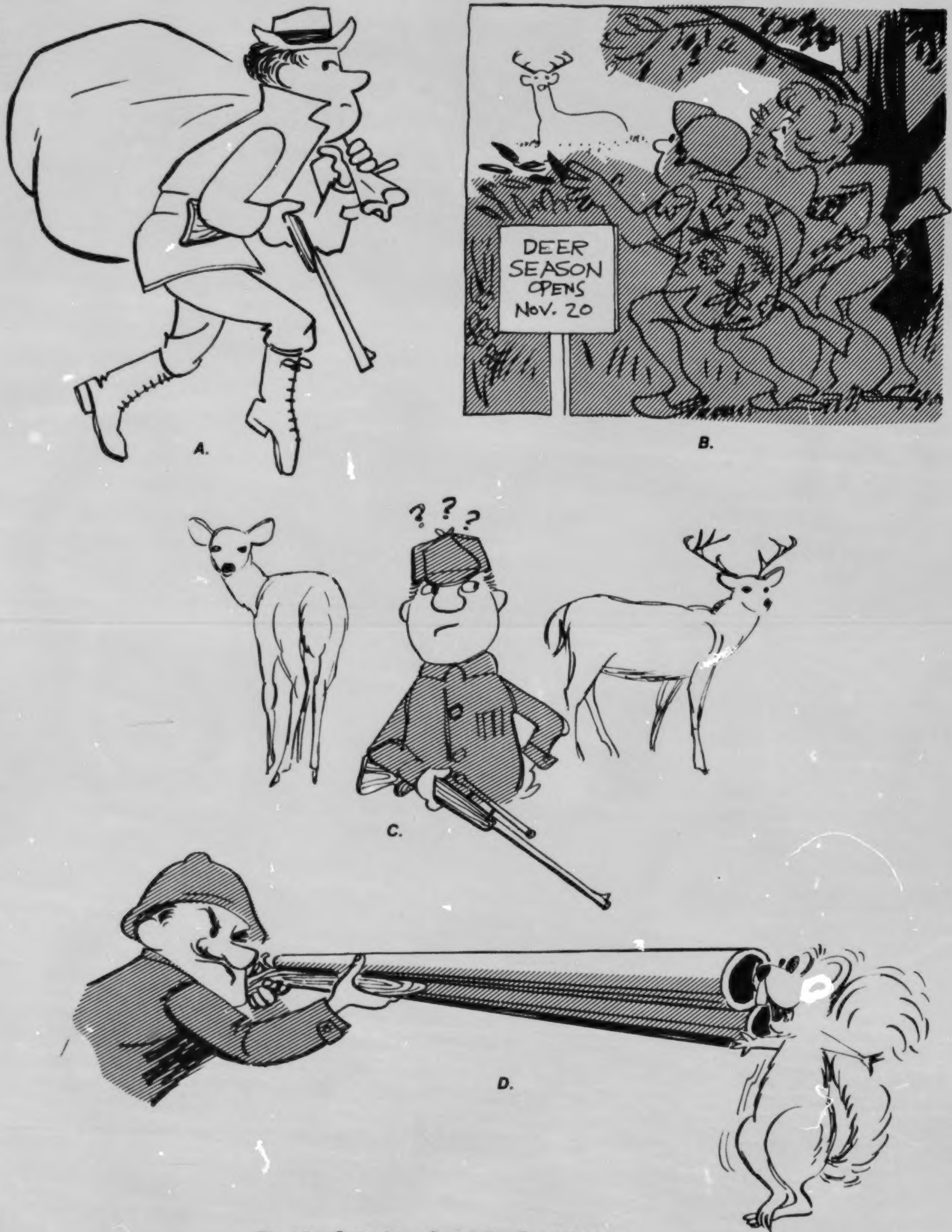

A.
DEER
SEASON
OPENS
NOV. 20
B.
? ? ?
C.
D.

Fig. 10.1 Game Laws Regulating Sport Hunting A. Bag Limits B. Seasons C. Harvesting Animals by Sex D. Matching Caliber and Game

11

Competition Shooting

***Objectives:** After completing this assignment, you should be able to—*

1. *describe the layout and procedures used in "trap shooting";*
2. *identify equipment sold for trap and "skeet shooting";*
3. *cite the type of gun used for trap shooting;*
4. *describe the layout and procedures used in skeet shooting;*
5. *name the national organization with affiliated clubs that sponsor shooting matches.*

Firearms are used for more than shooting game and for self-protection. Several types of shooting competitions have developed over the years. Some are more formal than others. Some are conducted nationally, others locally. Some shooters are not hunters. Many gun owners use their guns exclusively for competition shooting.

Competition shooting provides several benefits to those who take part. Almost any shooter can participate. Matches are held for male and female shooters of various age categories. Those who really get involved in competition shooting have an opportunity for travel, new friendships, and recognition. Some civilian and military teams compete in national and international matches. Formal and informal matches occur year-round.

These competitions are a good activity for hunters. During the times of the year when hunting seasons are closed, shooters can usually exercise their sharp-shooting skills in these competitive matches.

Trap Shooting

Trap shooting gets its name from the early-day matches. An old sport, trap shooting was popular in England 150 years ago. It was first practiced in America in Cincinnati in 1831.

Birds were put into traps and were then released at intervals. The shooter would shoot at each bird as it flew away. Today, the live birds have been replaced by clay targets. Live bird shooting is still practiced to a limited degree in Europe.

A modern trapshooting competition involves a mechanical throwing device and clay targets (see fig. 11.1). The trapshooting ramp is fan-shaped and consists of five concrete walkways that are separated by grass. The shooters take positions on these walkways at 16 yards from the trap. Each walkway is 3 yards from the next walkway.

The shooters, positioned around the fan-shaped ramp, shoot one at a time. The shooter at position one, for example, will shoot at five targets. He or she will then move to position two and fire five times when his or her turn occurs. A total of 25 shots are fired during each match.

The trap (see fig. 11.2) is a low box that contains an automatic target-throwing device. The throwing device is designed to throw the targets at random angles and elevations. A trap should not repeat a sequence of target throws since shooters may learn to anticipate the next target's flight. The target is called a *clay bird* or a *clay pigeon.* The trap may throw the target straight away from the shooter or at any angle of up to 45 degrees from the trap box. The target may fly close to the ground or it may fly as high as 12 feet above the ground.

A trap shooter who consistently has a high score may be given a handicap. This means that the shooter will have to shoot at the target from a distance greater than 16 yards behind the trap. The distance may vary from 16-25 yards.

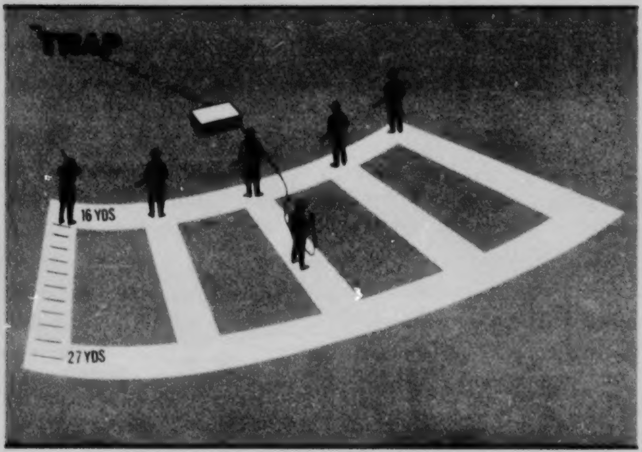


Fig. 11.1. Trapshooting Layout

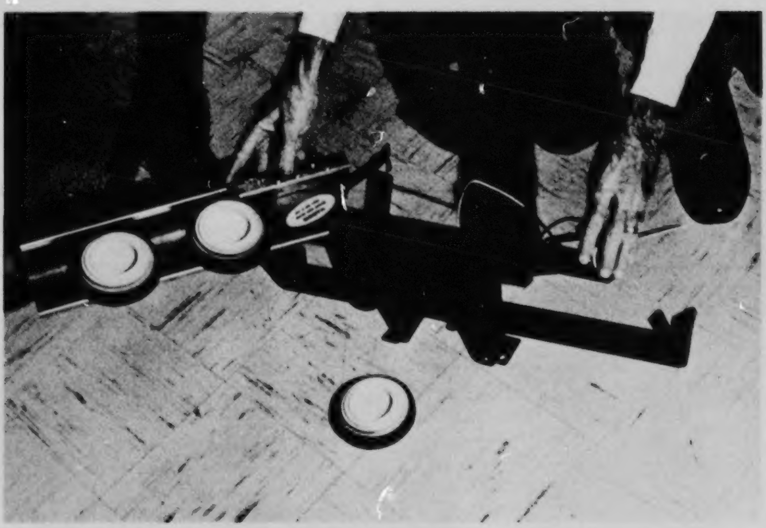


Fig. 11.2. Trap with Clay Pigeons
(Courtesy Oshman's Sporting Goods, Austin, Texas)

Most trap shooting is done at public shooting ranges or at private clubs. Some individuals have trapshooting facilities. A shooter may also find it possible to use shooting range facilities at a local military base. At most shooting ranges, the range operator charges a flat fee for each set of 25 clay targets. The shooter ordinarily provides his own gun and ammunition.

Shotguns that are manufactured specifically for trap shooting have full *chokes* (see Assignment 14) and long barrels. The barrel usually has a *ventilated rib* for quick sighting (see fig. 11.3). A ventilated rib also helps dissipate the heat of the barrel more quickly. The standard trap load is 3 grams of powder and 1⅛ ounces of no. 7½ or 8 shot (see Assignment 15).

Skeet Shooting

Skeet shooting developed specifically for the purpose of off-season wing-shooting practice. Early practice efforts consisted of throwing clay birds with hand-held target launchers. The targets were thrown at different angles so the shooter could practice most of the shots that would be presented by a flying bird. Later on, a sequence of shots and positions was developed. What began as a very informal practice session developed into a formal procedure. As hunters became aware of the skeetshooting method of practice, its popularity spread across much of the country. Skeetshooting competition soon started and was widely accepted.

In skeet shooting, eight shooting positions are located in a half-circle shooting ground (see fig. 11.4). A shooter stands at each position and fires in turn. There are two traps. The trap on the left of the shooter is located 10 feet above the ground. Targets from this trap simulate a bird in full flight. The trap on the right is located at ground level. Targets from this trap simulate birds that fly from the ground, or low-flying birds. Tradition has the hunter call "pull" when ready for the left target and "mark" when ready for the right target. These traps are 40 yards apart.

The shooter fires two shots from each position. First, a target comes from the left trap and then another from the right trap. In addition, the shooter attempts a double-bird shot at four of the positions. At the shooter's call, a bird is released from one trap. After a very short delay, the second bird is released from the other trap. This makes a total of 24 targets. If a shooter hits all 24 targets, the twenty-fifth shot is taken from the position selected by the shooter. If a target is missed before the twenty-fifth shot, the shooter repeats the first shot mis[illegible] a total of 25 shots.

The gun is normall[illegible]eld in an informal position until the target appears. Skeet guns have open chokes. The shotshell is loaded with a small shot. Number 8 or 9 shot is satisfactory for skeet shooting.

Rifle and Pistol Shooting

Rifle and pistol competition shooting take many forms. Some shooting matches are standardized nationally. Others are local or regional in nature and may vary from one place to another.

The National Rifle Association has affiliated clubs that sponsor shooting matches. Shooters participating in these matches can become as involved as talent and ability to travel will

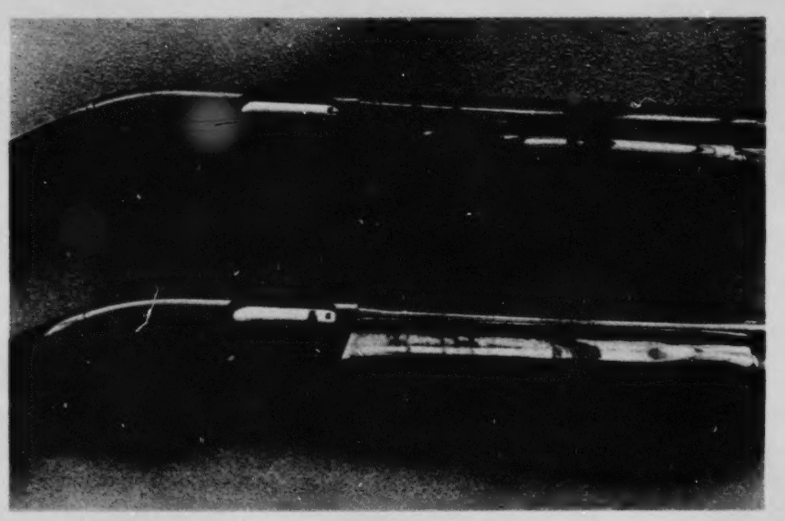


Fig. 11.3. Pump (above) and autoloading shotguns, with full chokes and ventilated ribs, are effective trapshooting guns.

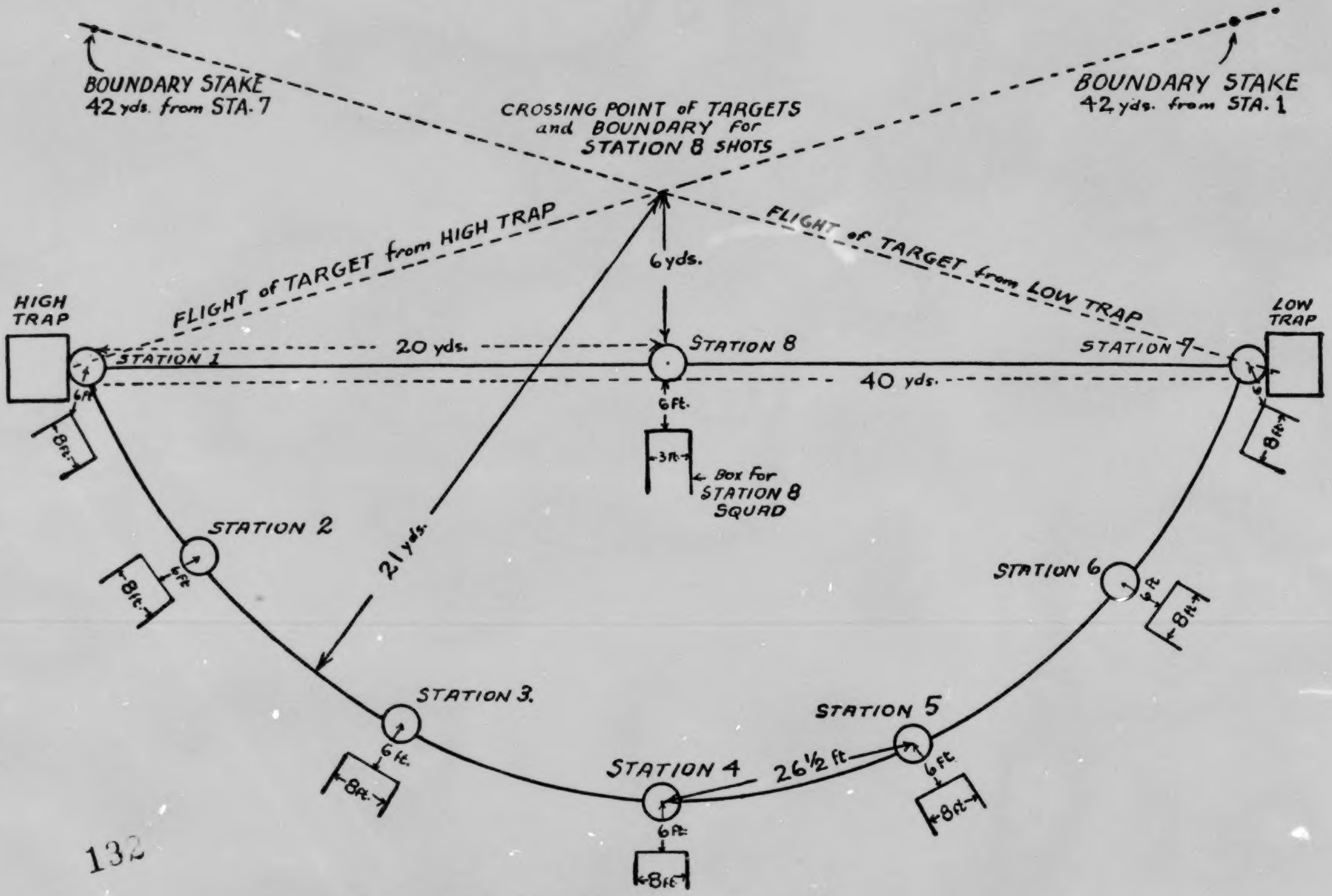

BOUNDARY STAKE
42 yds. from STA. 7
CROSSING POINT of TARGETS and BOUNDARY for STATION 8 SHOTS
BOUNDARY STAKE
42 yds. from STA. 1
FLIGHT of TARGET from HIGH TRAP
6 yds.
FLIGHT of TARGET from LOW TRAP
HIGH TRAP
LOW TRAP
20 yds.
STATION 1
STATION 8
STATION 7
40 yds.
6 ft.
6 ft.
8 ft.
3 ft.
Box for STATION 8 SQUAD
8 ft.
STATION 2
6 ft.
8 ft.
21 yds.
STATION 6
6 ft.
8 ft.
STATION 3.
STATION 5
6 ft.
8 ft.
STATION 4
26½ ft.
6 ft.
8 ft.
6 ft.
8 ft.

Fig. 11.4. *Skeetshooting Layout*
(Courtesy New Hunter's Encyclopedia, Stackpole Books, Harrisburg, Pennsylvania)

allow. They may participate in indoor or outdoor small-bore matches or in outdoor matches in which larger-caliber guns are fired. A participant in any match should quickly learn the rules of the match and the protocol expected of a match shooter.

Another kind of shooting contest is the old German schuetzenfest. This is popular around the country in towns with a strong German influence. This shooting match has been changed somewhat from the original where the targets were 200 yards from the shooter. In most places, the targets are now placed a distance of 100 yards from the shooters. Shooters in this contest must use rifles with iron sights and must shoot from a standing position.

Most of your customers will probably be interested in buying guns and equipment for hunting. Some customers, however, will be involved in competition shooting at some level. As a sporting goods salesperson, you should learn about the competition shooting conducted in your area. Competition shooters will have special preferences in the ammunition and guns they use. And competition shooting usually creates a need for accessories that your store may handle. By learning more about this phase of sport shooting, you should do a better job of serving your customers. Through increased sales, you will also help yourself and your store.

Questions

1. Why is *trap shooting* called by that name?

2. What kind of gun is best for trap shooting?

3. What special equipment is used in trap shooting today?

4. For what purpose was *skeet shooting* first developed?

5. What national shooting organization sponsors shooting matches?

Projects

1. Review the literature provided by shotgun manufacturers. Make a list of all guns and ammunition specially designed for trap or skeet shooting.

2. Contact the National Rifle Association about its small-bore rifle competition. Write a report about that competition.

3. Visit a shooting range and closely study the layout of the trap and skeetshooting areas. Construct a model or draw a picture of a trap of skeetshooting range.

12

Your Role as a Hunting Equipment Salesperson

Objectives: *After completing this assignment, you should be able to—*

1. *give the two major differences between hunting and fishing equipment sales;*
2. *list the tasks performed by a hunting equipment salesperson;*
3. *name the most important task performed by a hunting equipment salesperson;*
4. *give a definition for selling;*
5. *explain why stockkeeping is the first step toward learning a store's merchandise; and*
6. *tell which publications offer the best single source of product information for the serious salesperson.*

Salespeople in hunting equipment stores perform most of the tasks of salespeople in fishing tackle stores. In fact, most salespeople in a sporting goods store will be expected to handle both hunting and fishing equipment.

However, two major differences exist in hunting equipment sales. First, hunting equipment is generally more expensive than fishing equipment. And second, the sale of some hunting equipment (firearms and bullets) is subject to special federal and, sometimes, state and local laws.

Tasks Performed by Hunting Equipment Salespeople

In the tasks performed by fishing tackle and hunting equipment salespeople, the task functions are the same and only the merchandise differs. Receiving and checking a shipment of fishing lures is not much different from receiving and checking a shipment of ammunition. The procedure is the same in both cases.

Among the tasks performed by hunting equipment salespeople in most stores are *ordering merchandise, receiving and checking merchandise, pricing, stocking and displaying merchandise,* and *housekeeping.* The salesperson is also responsible for *operating the cash register, staying informed about advertised merchandise, helping take inventory, receiving merchandise for repair and adjustment,* and *protecting the store.* Assignment 3 provides a thorough review of each of these tasks. Other tasks that relate to handling and selling firearms will be discussed in Assignment 13.

Selling is the most important task performed by the sporting goods salesperson. Because it is such a major task, selling is the subject of the rest of this assignment.

Selling Hunting Equipment

Selling can be defined as **determining a customer's needs or wants and satisfying those needs or wants with merchandise or a service.** The goal of a good salesperson is that each customer will leave the store in a "state of satisfaction." A salesperson who explains how a certain insulated boot is designed to keep feet warm and sells a pair of the boots is selling satisfaction to one who has experienced or is worried about having cold feet while hunting.

Selling satisfaction through your merchandise or service should be your goal. This can be accomplished with every product carried by your store, from a simple rifle sling to your most expensive over-and-under shotgun. A salesperson needs two basic types of knowledge—(1) product knowledge and (2) an understanding of why people buy hunting equipment.

Product Knowledge

Knowing your store's merchandise is an absolute necessity if you expect to be able to suggest items to satisfy customer needs or wants. The scope of what must be learned is sometimes overwhelming. It is surprising, however, how quickly an alert salesperson learns valuable product knowledge. Product information can be gained in several ways.

(1) Stockkeeping is the first step to learning about merchandise of any kind. The sales trainee begins by cleaning, dusting, replacing, and sorting the various items. He or she becomes familiar with names and prices, locations and assortments, and model names and numbers. And as study progresses, the trainee identifies parts by name, using the standard terms accepted by the trade.

(2) Trade literature, price lists, and advertising materials are excellent sources of technical and sales information. Each manufacturer and supplier of sporting goods produces vast amounts of such literature. Advertising provides helpful sales-oriented facts about specific items. Advertisements catalogue and identify features, giving descriptive selling points and suggesting new ways in which the item can be presented. Price lists give specifications and more detailed information for the professional and experienced customer. Trade literature shows illustrations and indicates which models are recommended for specific tasks and performances.

(3) Trade journals and sports magazines offer the best product information for the serious salesperson (see fig. 12.1). These publications cover every facet of the field, including new merchandise, new laws and regulations, hunting facts about game, equipment to use, and the features and benefits of every piece of hunting equipment.

A vast number of trade publications are available for the retailer's use because hunting and fishing equipment appeal to a large segment of America's population. On newsstands are great numbers of general-interest sports magazines, as well as buyers' guides and gun digests of every description. Keeping current with these is no small task, but the dedicated salesperson reads articles of interest that will aid him or her in selling to customers.

(4) Manufacturers' and wholesalers' catalogues are good sources for quick information, specifications, features, and prices. When the customer wants to know about specific aspects of certain merchandise, these catalogues are of great value.

(5) Experienced personnel and knowledgeable customers are valuable to the new sales trainee. Listening and observing are perhaps the best methods of learning in the beginning. Confidence comes with knowledge and experience.

Why People Buy Hunting Equipment

People have many motives for buying merchandise and services. Likewise, they have various motives for buying hunting equipment. Some of these motives were discussed in Assignment 3, and you should review them. Some of the buying motives of customers in hunting equipment stores are listed as follows:

(1) Desire for utility. The person wants a product that is dependable and one that will last a normal product lifetime. The quality of the merchandise is more important than brand or price.

(2) Desire for prestige. Some people want the best of everything and take great pride in owning the most expensive equipment. Price is usually not a factor and name brands are preferred.

(3) Desire for comfort. A customer shopping for clothing and footwear or a hunter wishing to buy a good-quality but lightweight shotgun often displays this need. A heavy gun can become uncomfortable during a hard day of hunting.

(4) Desire for economy. Some customers think only of the moment. The immediate cash outlay is more important than the fact that the product is not likely to last very long.

You will notice these and other desires as you serve your customers. Your job is to help the customer to buy intelligently, but you must also satisfy his or her basic need or desire for a product or service.

Fig. 12.1. Trade Literature
(Courtesy McBride's Gun Store, Austin, Texas)

Questions

1. What are two major differences between sales in hunting equipment and fishing equipment?

2. What are the tasks performed by hunting equipment salespeople? (Any five are correct.)

3. What is the most important task performed by a hunting equipment salesperson?

4. How might the term *selling* be defined?

5. What should be the first step in learning about a store's merchandise?

6. Which publications offer the best product information for the serious salesperson?

7. Does one single motive cause people to buy hunting equipment?

Projects

1. Make a list of all trade journals that are published for hunting equipment workers.

2. For one day, try to decide the actual buying motive of each customer you serve. At the end of the day, record all the buying motives you observed, and indicate how many customers fell into each buying motive category.

3. Make a list of all the duties of full-time salespeople in your store.

13

Your Role as a Firearms Salesperson

***Objectives:** After completing this assignment, you should be able to—*

1. *explain how to "trade up" a customer who fits into the "desire for prestige" category;*
2. *explain what product knowledge might be useful when selling to a customer with a desire for quality and utility;*
3. *state which features of a gun that a customer buying for a son or daughter will be especially concerned with;*
4. *cite the difference between the "desire for prestige" buying motive and the "desire to please oneself—pride of ownership" buying motive;*
5. *describe how a salesperson can learn about the investment value of guns;*
6. *explain how to demonstrate a gun to a customer;*
7. *define the term "lock time";*
8. *name several categories of persons who cannot legally buy a gun; and*
9. *tell what a "gun book" is.*

Although considered to be hunting equipment, the sale of firearms deserves special treatment. Firearms are usually the big ticket items in a sporting goods store. The aim of this assignment is to help you become a better firearms salesperson.

Meeting Customer Needs and Wants

Buying motives vary from time to time and sometimes from one item of merchandise to another. In this section, those needs and wants are discussed as they relate to gun sales.

A Desire for Prestige

Most people have a real need to be accepted and approved by others. Some try to gain approval or recognition by displaying what they own. A big house, an expensive car, fine jewelry, and other personal possessions are often purchased for this reason. The buyer purchases such items in hopes that other people will think more highly of him or her.

This practice of using personal possessions in order to gain prestige is sometimes exhibited by people who buy guns. This type of customer will be willing to pay a premium price for a fine gun if he or she knows that friends and acquaintances will be impressed with the gun. A less expensive gun might have served the person's hunting needs just as well as the expensive gun.

As a gun salesperson, you must realize that guns are often purchased primarily to increase the owner's prestige. The gun's performance may be a secondary consideration.

When you feel that a customer fits into the "desire for prestige" category, do not hesitate to "trade up." Continue to introduce higher-quality guns until the customer indicates that he or she is satisfied with a particular gun. Good judgment must be exercised here. Remember that the customer is not looking for the best rifle for the price. The object is to buy recognition and approval from others. This is usually accomplished only by purchasing a gun with an established name brand.

You must show high-quality guns to the customer. Respected foreign brands are often preferred by this type of customer. While demonstrating the gun, mention other prominent people who own the same gun. You may also mention articles about the gun that appear in gun magazines or other sports magazines.

Your job is to help this person buy as much prestige as he or she can afford.

A Desire for Quality and Utility

People who hunt a lot will usually want a gun that performs as expected and one that doesn't need to be pampered. Most of these shooters take good care of their guns. They don't like to worry about repairs, especially during a hunting season.

Probably, several guns will satisfy this type of hunter's needs. Brand preference may come into the picture. Those who have more money to spend may buy an expensive gun. Most of the time, the choice is based upon the gun's quality, not its price. Very expensive guns usually are of the highest quality and may carry a lifetime guarantee. This is important to anyone who hunts on a regular basis or who regularly participates in some form of competition shooting.

Product knowledge is especially important when selling to a customer with a desire for quality and utility. Discuss the strength of the action, special materials, reinforced or heavy-duty parts, and the quality of the wood in the stock. Show the customer features like an extra-convenient safety or a hinged floor plate on the magazine. Point out safety features that give the gun a safety advantage over other guns.

A Desire to Please Someone Else

Guns are often bought as gifts for other people. The purchase may be a gift for a son, daughter, spouse, or friend or relative. It is possible that the "desire for prestige" can influence this purchase. The person may be trying to strongly impress the person receiving the gun. This is an indirect attempt to buy prestige. The customer usually is more interested in giving than in impressing the person receiving the gun.

If the gun is to be given to a son or daughter, the utility value of the gun is important. The buyer will probably be especially concerned with the gun's safety features. You should spend enough time demonstrating these features to satisfy the customer's concern.

One big favor you can do for the customer and the person receiving the gun is to encourage the purchase of a repeating rifle or shotgun. A single-shot firearm is satisfactory for occasional tin can shooting and for occasional hunting. However, a young hunter who really becomes interested in hunting will quickly outgrow a single-shot rifle or shotgun.

Some customers may think that you are recommending "too much gun" for a beginner. So, point out that a repeating gun can be used as a single-shot gun during the learning period. Some customers may think that you are improperly trying to "trade them up," so this must be handled in a skillful way. This will be difficult to do unless you are convinced you are doing the customer a favor.

A Desire to Please Oneself—Pride of Ownership

Several of your customers will buy guns just for the enjoyment of owning the gun. If you own a gun, you may remember the pride and excitement that you felt when you first received it. This is a common buying motive for collectors—mainly those who do not trade their guns.

Do not make the mistake of confusing the "desire to please oneself—pride of ownership" motive with the "desire for prestige" motive. Most of the time, customers with the former buy only for their own enjoyment. Most do not show their guns to others, except for friends or relatives who also value guns. This inner satisfaction of gun ownership is found at all social and economic levels. And even an inexpensive gun can instill pride in the owner.

As a person begins to collect guns, it is possible that he or she will become more interested in high-quality guns. If a customer can afford to do so, it is possible that he or she will buy high-quality firearms. These firearms may be of the same or a higher quality than those bought by a customer with a desire for prestige. This type of person is likely to be a good repeat customer. Remember that there is a difference in buying a gun to please yourself and in buying to please others.

A Desire for an Investment

Guns are generally a good investment. Some people would never consider selling one of their guns. Others have learned that trading guns can be very profitable. Most who buy guns for investment purposes also enjoy guns.

Wise buying is critical if a gun is intended to be an investment, and some guns are better than others. Investment buyers must know which brands, models, and gauges or calibers are most popular. Knowing how many guns of a certain model were made, serial number designations, and manufacturing plans is important. Discontinued models and calibers are often good prospects for investment buying.

If you have customers who buy for investment, you should try to learn from them. Talk to gun wholesalers and factory representatives. Trade journals and sports magazines may also have articles that relate to investment opportunities with firearms.

To summarize, every firearm purchase is aimed at satisfying some want or need (see fig. 13.1). Your first job in any sale is to ask questions that will help you determine the particular want or need of your customer.

Demonstrating Your Product

Some products are best demonstrated by letting the customer see them in action. This is easily done with a sewing machine, an electric drill, and many other items of merchandise. This is not the case with selling guns. It is easy to show how to load and unload a gun, work the action, adjust sights, and demonstrate some other features. The ultimate demonstration of having the customer actually fire the gun is not often possible.

One important point to remember is *never* to prepare the gun for firing by placing a bullet into the gun chamber. Some stores have the policy of not having live ammunition out at the same time the gun is being demonstrated. This is the safest approach. Some secondhand gun shops have ranges or galleries where a customer can test a gun before buying it. Even in these stores, you should wait until the customer is in the proper place before live ammunition is loaded into the gun.

You will later become familiar with some of the terms used in this section. Meanwhile, these steps should be followed when demonstrating a gun:

- As you take the gun off the shelf, open the action of the gun and make sure it is unloaded.
- Let the customer handle the gun.
- Let the customer work the action. Comment on how smooth it is.
- Show the customer how the gun is loaded and unloaded. (But do *not* place ammunition in the gun.) Be sure to demonstrate the safety advantages of a *hinged floor plate* on the magazine. With this device, cartridges can be ejected from the gun without working the action.
- Show the customer all the safety features of the gun.
- Take the gun off safety, and let the customer pull the trigger. Comment on how crisp the trigger feels. At this time, explain "lock time" as this is one of the gun's strong features. Lock time refers to the time lapse between the pulling of the trigger and the actual firing of the gun. It is usually measured in thousandths of a second. This may be critical if the shooter happens to flinch, has trouble holding on target, or is shooting a flying bird.
- Let the customer look down the barrel. Explain the rifling grooves, if it is a rifle or pistol.
- Show how the sights are to be used. If the sights are adjustable, explain how to adjust them. If they are not adjustable, explain that they are factory-set for targets a certain distance from the shooter.
- For all guns, explain the importance of the gun fitting the shooter. Show the customer how the gun should fit.
- Show the customer how to oil and clean the gun. Demonstrate simple takedown operations like removing the bolt from a bolt-action rifle.
- Explain the type of finish on the stock or handles, and explain how to care for it.
- Explain the gun's warranty, and show the customer how to complete the warranty card.
- Handle all guns with pride. A gun represents a big cash outlay for most customers.

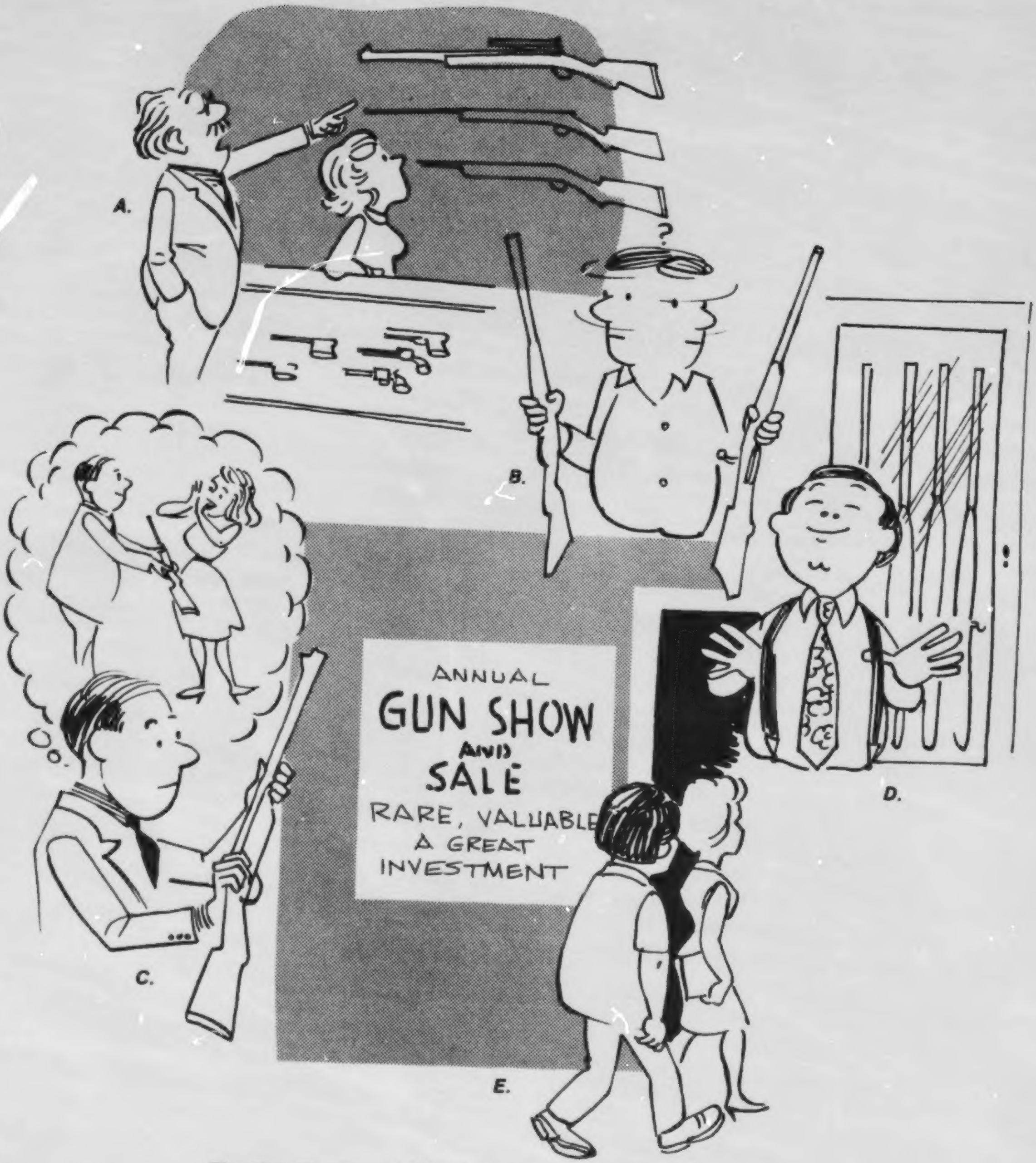

A.
?
B.
C.
ANNUAL
GUN SHOW
AND
SALE
RARE, VALUABLE
A GREAT
INVESTMENT
D.
E.

Fig. 13.1. *Customer Needs and Desires*
A. Desire for Prestige B. Desire for Quality and Utility
C. Desire to Please Someone Else D. Desire to Please
Oneself—Pride of Ownership E. Desire for Investment

After it is handled, wipe off fingerprints with a soft rag.

These are some of the things you should remember to do as you try to sell a gun to a customer. You will learn other techniques from fellow salespeople and through experience.

Legal Restrictions on Gun Sales

Since a gun can be a dangerous and lethal weapon, laws exist concerning the sale of firearms. Consult with your store manager or department supervisor about the laws in your area. The salesperson must comply with applicable laws.

Maintain a "Gun Book"

Each store that sells firearms keeps thorough records concerning the guns they handle. Many use a notebook with forms on which required information can be recorded. Some stores call this a "gun book" (see fig. 13.2). When a gun is received, it is entered into the book. Information recorded in the book usually includes the brand, model, caliber or gauge, and serial number of the gun. Other information may include the type of trigger, hammer, and grips. The date on which the gun was received is also entered.

When the gun is sold, the date of sale is entered into the book, along with the price of the gun and some information about the customer. In addition to satisfying legal requirements, the gun book is a good source of information about guns in stock. This is especially handy for telephone inquiries.

Observe Local Laws Requiring Waiting Periods

Some states or communities have laws that require a purchaser to wait a few days before completing the sale of a firearm. This is to prevent a person who is in a dangerous emotional condition from buying a gun and shooting someone else. The waiting period lets the person "cool off."

Receiving and Securing Guns

The receiving function is much the same for guns as for other merchandise. After the invoice is verified, the guns are recorded in the gun book. It is important that the guns be accounted for at all times and that they be kept in a secure place, behind locked doors. This is especially important in a department store where several employees may be in the stockroom.

Guns are a favorite target of burglars because they are easy to sell. For this reason, federal and state officials strongly support good security for a store's firearms.

Having Customers Complete Form 4473

The federal government requires that certain information be kept about persons who buy

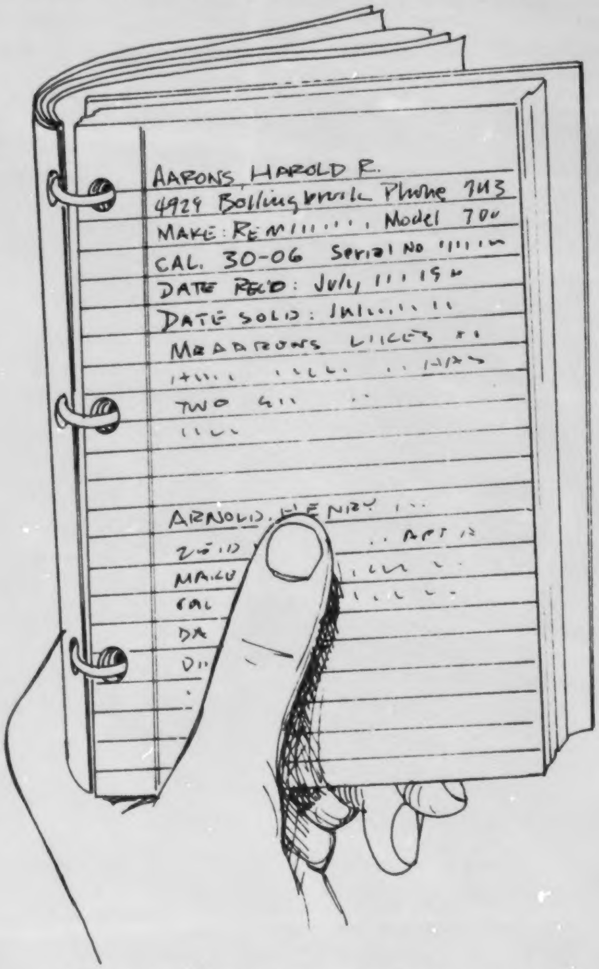
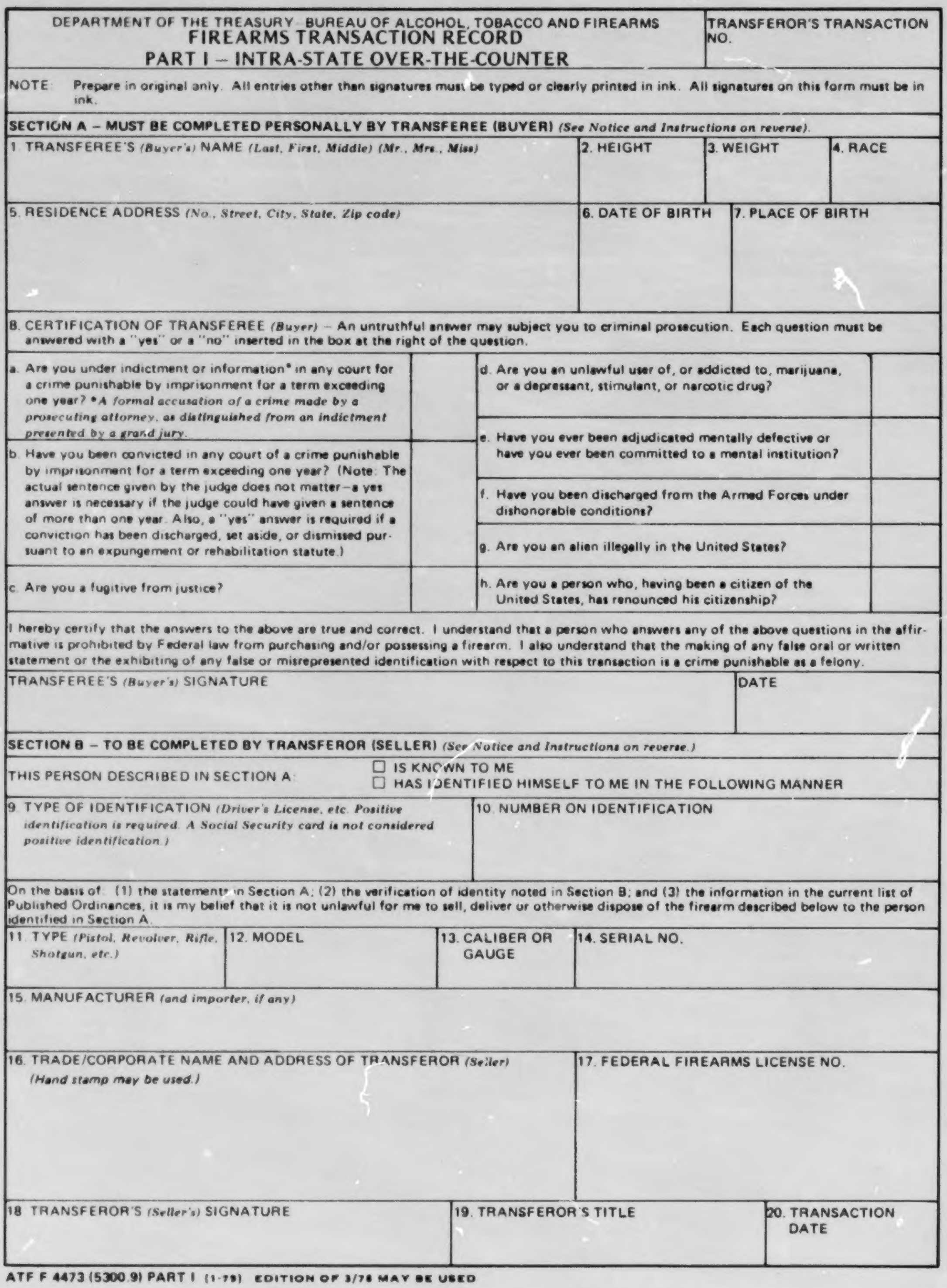


Fig. 13.2. Information recorded in the "gun book" usually includes the brand, model, caliber or gauge, and serial; the date the gun was received; the date sold; and some details about the customer.



DEPARTMENT OF THE TREASURY - BUREAU OF ALCOHOL, TOBACCO AND FIREARMS

FIREARMS TRANSACTION RECORD

PART I – INTRA-STATE OVER-THE-COUNTER

TRANSFEROR'S TRANSACTION NO.

NOTE: Prepare in original only. All entries other than signatures must be typed or clearly printed in ink. All signatures on this form must be in ink.

SECTION A – MUST BE COMPLETED PERSONALLY BY TRANSFEREE (BUYER) *(See Notice and Instructions on reverse).*

1. TRANSFEREE'S *(Buyer's)* NAME *(Last, First, Middle) (Mr., Mrs., Miss)*	2. HEIGHT	3. WEIGHT	4. RACE

5. RESIDENCE ADDRESS *(No., Street, City, State, Zip code)*	6. DATE OF BIRTH	7. PLACE OF BIRTH

8. CERTIFICATION OF TRANSFEREE *(Buyer)* – An untruthful answer may subject you to criminal prosecution. Each question must be answered with a "yes" or a "no" inserted in the box at the right of the question.

a. Are you under indictment or information* in any court for a crime punishable by imprisonment for a term exceeding one year? **A formal accusation of a crime made by a prosecuting attorney, as distinguished from an indictment presented by a grand jury.*		d. Are you an unlawful user of, or addicted to, marijuana, or a depressant, stimulant, or narcotic drug?	
b. Have you been convicted in any court of a crime punishable by imprisonment for a term exceeding one year? (Note: The actual sentence given by the judge does not matter—a yes answer is necessary if the judge could have given a sentence of more than one year. Also, a "yes" answer is required if a conviction has been discharged, set aside, or dismissed pursuant to an expungement or rehabilitation statute.)		e. Have you ever been adjudicated mentally defective or have you ever been committed to a mental institution?	
		f. Have you been discharged from the Armed Forces under dishonorable conditions?	
		g. Are you an alien illegally in the United States?	
c. Are you a fugitive from justice?		h. Are you a person who, having been a citizen of the United States, has renounced his citizenship?	

I hereby certify that the answers to the above are true and correct. I understand that a person who answers any of the above questions in the affirmative is prohibited by Federal law from purchasing and/or possessing a firearm. I also understand that the making of any false oral or written statement or the exhibiting of any false or misrepresented identification with respect to this transaction is a crime punishable as a felony.

TRANSFEREE'S *(Buyer's)* SIGNATURE	DATE

SECTION B – TO BE COMPLETED BY TRANSFEROR (SELLER) *(See Notice and Instructions on reverse.)*

THIS PERSON DESCRIBED IN SECTION A:
☐ IS KNOWN TO ME
☐ HAS IDENTIFIED HIMSELF TO ME IN THE FOLLOWING MANNER

9. TYPE OF IDENTIFICATION *(Driver's License, etc. Positive identification is required. A Social Security card is not considered positive identification.)*	10. NUMBER ON IDENTIFICATION

On the basis of: (1) the statements in Section A; (2) the verification of identity noted in Section B; and (3) the information in the current list of Published Ordinances, it is my belief that it is not unlawful for me to sell, deliver or otherwise dispose of the firearm described below to the person identified in Section A.

11. TYPE *(Pistol, Revolver, Rifle, Shotgun, etc.)*	12. MODEL	13. CALIBER OR GAUGE	14. SERIAL NO.

15. MANUFACTURER *(and importer, if any)*

16. TRADE/CORPORATE NAME AND ADDRESS OF TRANSFEROR *(Seller)* *(Hand stamp may be used.)*	17. FEDERAL FIREARMS LICENSE NO.

18. TRANSFEROR'S *(Seller's)* SIGNATURE	19. TRANSFEROR'S TITLE	20. TRANSACTION DATE

ATF F 4473 (5300.9) PART I (1-79) EDITION OF 3/78 MAY BE USED

Fig. 13.3. *Form 4473 is completed and signed by the customer. Section 8, particularly, contains vital information which will help you determine whether or not to sell gun to a customer.*
(Courtesy Department of the Treasury, Bureau of Alcohol, Tobacco, and Firearms)

guns. Form 4473 (see fig. 13.3) is completed and signed by the customer. Information includes the customer's full name, address, and social security number. The customer also certifies that he or she is legally able to buy a gun. This means that the customer (1) is not a convicted felon, (2) is not under indictment, (3) is not a fugitive from justice, (4) is not an unlawful drug user, (5) has not been committed to a mental institution or adjudged mentally defective, (6) has not been dishonorably discharged from the Armed Services, (7) has never renounced U.S. citizenship, and (8) is not a minor.

Some stores have the customer complete the form and do not closely supervise its completion. The salesperson should help the customer complete the form. Be sure to verify the information given with a driver's license or other official identification.

You may find that your store has other state or local regulations to follow concerning the handling and selling of firearms. Your particular store may have policies that provide better security for your guns. Remember that a gun is only as safe as the person handling it.

Questions

1. Should you attempt to "trade up" a customer who fits the "desire for prestige" category?

2. What product knowledge might be important when selling to a person with a desire for quality and utility?

3. If a customer is buying a gun for a son or daughter, which features of the gun should the salesperson demonstrate?

4. Does the customer with a "desire to please oneself—pride of ownership" have the same buying motive as one with a "desire for prestige"?

5. How can a gun salesperson learn about the investment value of guns?

6. Is it all right to place a live bullet in the chamber of a gun you are demonstrating to a customer? What is a related safety precaution?

7. What is *lock time?*

8. What groups of people cannot legally purchase a gun?

9. What is a *gun book?*

Projects

1. Rank each gun carried by your store according to its prestige value. Do this by groups—*rifles, shotguns,* and *pistols,* ranking each from *1* (highest value) to *5* (lowest value).

2. Select five guns most likely to be bought for a son or daughter. Make a list of the safety features of each of the five guns.

14

Shotguns

***Objectives:** After completing this assignment, you should be able to—*

1. *give the major limitation of a shotgun;*
2. *cite the type of shotgun action that was most popular in the past, and which type is most popular today;*
3. *tell where the breech of a shotgun is located;*
4. *give the purpose of a raised rib on a shotgun;*
5. *give the definition of a choke;*
6. *tell what the term "magazine" means;*
7. *give the names of the two wooden pieces found on a shotgun;*
8. *list the four main types of shotgun actions in use today;*
9. *give another name for pump actions;*
10. *cite the type of action that most single-shot shotguns and double-barreled shotguns have; and*
11. *state why a 12-gauge shotgun is called by that name.*

The shotgun is the most *versatile* of all guns—that is, it can be used for hunting many types of game. It is not a good long-range gun, but it can be used on any game up to the size of a deer.

A shotgun fires shells that contain small pellets, called *shot.* The shell is expelled near the gun, while the shot propel to the target. The size of the shot can vary. So can the width of the circle they form when they hit the target.

Shotguns are primarily designed to hit moving objects. The owner of a shotgun can use small-sized shot and hunt for small birds like dove and quail. The gun may also be used for large birds like pheasant or turkey if larger shot are used.

Small animals like rabbits and squirrels are easily taken with a shotgun. Varmint hunters often load their shotguns with larger shot and effectively kill coyotes or bobcat. If a hunter wants to use the shotgun for deer, buckshot and rifled slugs can be used.

The shotgun is only effective for those shots of up to 60 yards maximum distance. It should be said that 50 yards is too far for most shotgun loads and for most hunters, but kills are possible at that distance. Most shots, even for deer, are within shotgun range. An exception to this would be if the hunter hunts in open areas, like the Great Plains.

Shotguns are also versatile in the many ways they meet the needs of gun owners. Some shotguns are simple and inexpensive. Other shotguns are fairly complicated and expensive. Enough types and models are manufactured so that every personal and hunting need can be met. A shotgun is an appropriate gift to a beginning hunter. It is easy to find a gun that is dependable but inexpensive. A shotgun is also an appropriate gift for a retiring executive who likes to hunt. If the company wants to lavishly reward the retiree, shotguns are available that cost several thousands of dollars.

Trends exist in shotgun buying as is true in any line of merchandise. Many years ago, the double-barreled shotgun was popular because it could be fired twice. Even today, some contend that the side-by-side double-barreled shotgun is the only shotgun to own. These people are called purists. They are like anglers who use nothing but a fly rod and dry flies. The double-barreled shotgun declined in popularity for a while, but it is now making a strong comeback. This is especially true of the over-and-under shotguns. These guns are sold mainly to shooters who have better-than-average incomes. The prices of these guns are usually much higher than those of other action types.

The pump shotgun has always been popular. This type of gun has probably accounted for more sales than any other. The autoloading shotgun is very popular now and is probably the favorite hunting shotgun of most shooters. As a gun salesperson, you will need to be aware of fads and trends in shotgun sales.

The Parts of a Shotgun

As a gun salesperson, you will need to know all the parts of a shotgun (see fig. 14.1). The parts will vary from one model to the next, but some parts are common to all shotguns.

The Barrel

A barrel is made by boring a hole in a long piece of steel. All gun barrels today are made of good-quality steel. However, barrels in antique guns may not be able to handle the high pressure produced by modern ammunition.

The barrel is the heaviest part of a shotgun. It is *blued* to help prevent rusting. In bluing, a lacquer, ready-mixed paint, or chemical is applied to the metal. This dulls the barrel color, so light is not reflected to scare game. Bluing, however, does not make a gun absolutely rustproof.

Most shotguns today have a single barrel, but this doesn't mean that most are single-shot shotguns. Shotguns with autoloading, pump, and bolt actions all have a single barrel. Although the majority of the guns produced today are single-barreled, a large number of double-barreled guns are also produced. All side-by-side double-barreled guns have barrels that are jointed together. Most over-and-under shotguns also have joined barrels. The Remington 3200 is one over-and-under shotgun that has separated barrels. The barrel on autoloader, pump, and bolt-action models is connected to the steel housing of the action.

Double-barreled guns and single-shot shotguns have a top-break action. This means that the barrel tips forward and down, away from the stock. The gun is loaded, and the barrel is raised and locks into place. The barrels of these top-break-action shotguns are held in place by a locking mechanism located in the fore-end.

The length of shotgun barrels varies. In every case, a shooter should use a gun that has a barrel that he can swing naturally and smoothly. Shooters who expect to shoot trap and to hunt waterfowl usually want a long barrel. Thirty inches is considered to be long, but most companies offer 32-inch barrels if desired by the buyer. Some "goose guns" have barrels of 35 to 40 inches. Dove and quail hunters prefer a shorter barrel. These will more easily and quickly swing onto a rapidly moving target. Most guns used for this purpose have barrels of 26 inches in length.

The breech of a shotgun is located at the rear of the barrel. This part of the shotgun is chambered to hold the shotshell. The chamber is sized to allow the insertion of the proper-sized shell. Adult shooters should know better, but it is good to remind young shooters not to put a smaller shell into the chamber. It is

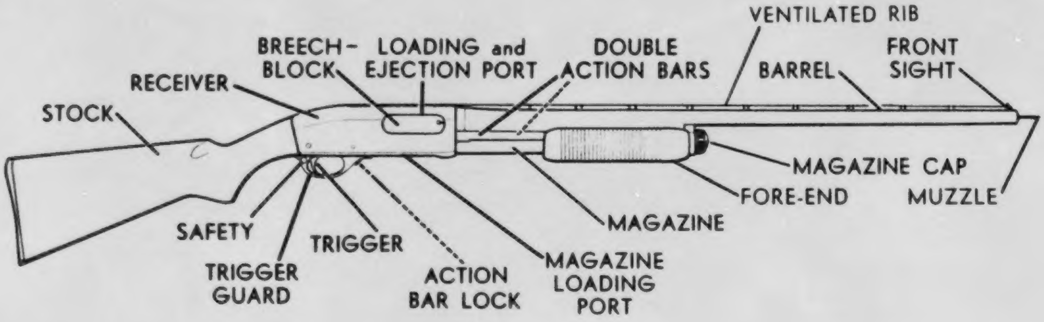


Fig. 14.1. *Major Parts of a Shotgun (Courtesy Remington Arms Co., Bridgeport, Connecticut)*

possible that a 16- or 20-gauge shell would slide forward into a 12-gauge barrel. This would "stop up" the barrel. If the 12-gauge shell was later fired, it is likely that the barrel would explode. This could cause serious injury to the shooter.

There are other parts of a shotgun barrel that should be discussed separately. They are the *sight*, the *raised rib*, and the *choke*.

The Sight. Shotgun barrels do not usually have *sights* like those found on rifle barrels. A shotgun does not usually have a rear sight. A bead-type front sight is found at the muzzle end of most barrels, which actually is unnecessary.

Aiming a shotgun is not as precise as aiming a rifle. A rifle is aimed with the intention of hitting a specific spot. A shotgun is aimed so the shot will reach an area where the target is approximated to be. Aiming the shotgun consists of looking down the barrel and moving it into a position that allows the shot the best chance of proceeding to the same area as the target. This usually means aiming in front of a moving target. The front sight helps some hunters position the end of the barrel into the proper place.

The Rib. Some shotgun barrels have a *raised rib*. The rib is a piece of metal that is about the same length as the barrel. It is usually about ⅜-inch wide and stands about ¼-inch above the top of the barrel. The rib's purpose is to help the shooter aim the gun more quickly. Since the rib is a narrow plane, it is easier to sight down the rib than down a round barrel.

The rib is on the top barrel of an over-and-under double-barreled shotgun. Almost all side-by-side double-barreled shotguns have a rib. The shooter aims down the rib, located above the line where the two barrels are joined. A rib is a necessity on a side-by-side double-barreled shotgun since the shooter does not aim down either barrel.

Raised ribs come in two types. The *solid rib* is a solid piece of metal. The other type of rib is called a *ventilated rib* (see fig. 14.2). In a ventilated rib, the sighting plane is connected to the barrel at points one or two inches apart. At other points, there is a space between the rib and the barrel. The ventilated rib is considered superior and usually costs more than a solid rib. The main advantage of a ventilated rib is that it helps a barrel cool off quicker than a solid rib does. This could be of value to competition shooters and others who are likely to shoot several times in a short span of time. A hot barrel may emit heat waves that interfere with the shooter's aim or with handling the gun.

On most single-barreled guns and over-and-under double-barreled guns, a raised rib is a desired option. The raised rib, especially a ventilated rib, is found on most high-quality guns.

The Choke. The walls of a shotgun barrel are parallel, except for the last few inches at the muzzle end of the barrel. At this point, the

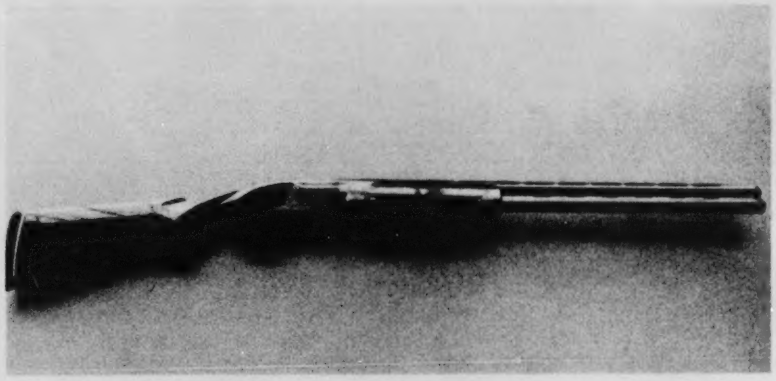


***Fig. 14.2.** Ventilated Rib on Over-and-under Shotgun (Courtesy McBride's Gun Store, Austin, Texas)*

barrel's diameter is reduced. This part of the barrel is called the *choke.* The choke constricts or compacts the shot as it goes through that end of the barrel. Its purpose is to control the spread of the shot.

If the choke is tighter, the shot will travel longer before it begins to spread apart. An open choke allows the shot to begin to spread very quickly after leaving the barrel. A person shooting at quail that just flushed and are only 20 yards away would need a fairly open choke. A person shooting at a goose 40 yards away would need a tighter choke. If an open-choked gun were fired at the goose, the shot would probably spread so far apart that it would miss the goose. On the other hand, if a full-choked gun is fired at a quail that is only 15 yards distant, the quail would be hit with so many shot that it would be inedible.

The three standard choke designations in today's shotguns are the *improved cylinder, modified,* and *full chokes.* The improved cylinder is fairly open and the full choke is the tightest of all chokes. Some quail and grouse hunters ask that their guns have a cylinder choke, a very open choke. Most companies that manufacture good-quality shotguns offer the buyer a choice of a skeet choke. This is an open choke that allows shot to quickly spread to an optimum pattern for skeet shooting.

Also available are adjustable or *variable* chokes (see fig. 14.3). These fit on the muzzle of the shotgun barrel. They permit the degree of choke to vary, either by turning a collar on the device or by replacing one part of the choke with another.

The Trigger and the Safety

The trigger is the narrow piece of metal that fires the gun when pulled. It usually extends down from the rear of the action. When the gun is cocked, a sear fits against the hammer or firing pin, or the sear may fit into a notch in the hammer. When the trigger is pulled, the sear slips out of the way and allows the hammer to fall or go forward. Since the hammer or firing pin is attached to a very strong spring, it falls with enough force to cause the shell to fire. The trigger in a good-quality gun can be adjusted to suit the shooter. A trigger that is too "light" can be dangerous. One that is too "stiff" or hard to pull can make it difficult for the shooter to attain accuracy.

The safety is usually a cross-bolt device that is pushed to keep the gun from firing. When the safety is pushed, a bolt slips into a position that prevents any movement of the trigger. The hammer or firing pin is not allowed to move toward the shell in the chamber.

The Breech Block

The breech block is the piece of metal that fits over the rear of the barrel when the gun is fired. This device ensures that none of the gas from the exploding shell finds its way back into the action. Locking lugs are used to keep the breech block tightly fitted against the breech of the barrel.

The Magazine

The part of a shotgun where shotshells are stored for ready use is called a *magazine.* There are two basic types of shotgun magazines. One is called a *tubular* magazine. The other is called a *clip-type* mgazine. The type of magazine used on a shotgun depends mainly upon the gun's action.

Tubular Magazines. A tubular magazine is usually found in shotguns with autoloading or pump actions (see fig. 14.4). Sometimes tubular magazines are used with bolt-action shotguns, but most of these use a clip-type magazine.

A tubular magazine consists of a tube or pipelike device and a spring. The shotgun shells are usually loaded through a slot in the side of the receiver. This slot is covered by a piece of metal held in place by a spring. As a shell is pushed against the metal-loading port, the spring is depressed. The cover is allowed to be pushed down, and the shell slips into the rear of the tubular magazine.

The shell is inserted into the magazine in the same position as when it enters the chamber. The base of the shell faces the rear of the gun while it is in the magazine. The first shell loaded into the tubular magazine comes in contact with the magazine spring. This spring keeps the shell pushed back against the rear "door" of the tube. As another shell is loaded into the

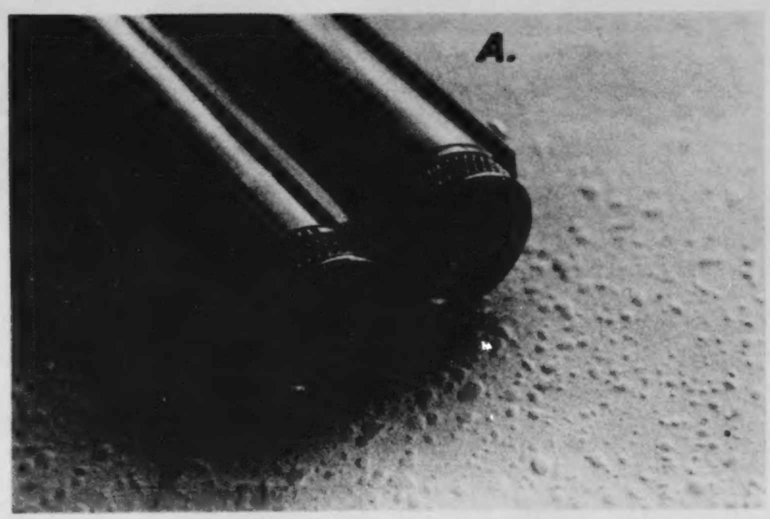


Fig. 14.3. *Variable Chokes*
A. Choke with adjustable collar B. Replaceable choke
(Courtesy Montgomery Ward, Austin, Texas)

magazine, the spring is depressed to allow the second shell into the tube. At all times, the last shell loaded is kept next to the rear "door" of the tube by the force of the spring. When the action is worked, the device at the rear of the tube allows one shell to be pushed into the receiver. From that point, the action moves the shell into the chamber, and it is ready to fire.

Most tubular magazines hold 4 shells. This enables the gun to have a 5-shot capacity if a shell is also placed in the chamber. Most guns with a 5-shot capacity are furnished with a wooden plug that can be placed in the magazine. This plug makes it possible to place only 2 shells in the magazine. Then the gun has only a 3-shot capacity and is legal for hunting migratory birds. Some police-model shotguns have extra-long tubular magazines that enable a gun to have an 8-shot capacity.

Clip Magazines. Bolt-action shotguns are usually equipped with a clip-type magazine (see fig. 14.5). The clip is a small metal box with a spring-loaded top. The clip is a bit wider and longer than a shotgun shell, and a bit deeper than the thickness of two shotgun shells. Most shotgun clips hold only two shells.

The clip is detachable from the shotgun and usually fits into the bottom of the stock. It is located just behind the chamber of the barrel. A lever or button is depressed to release the clip from the gun.

When the shooter wishes to load the clip, it is removed from the gun. A spring-loaded piece

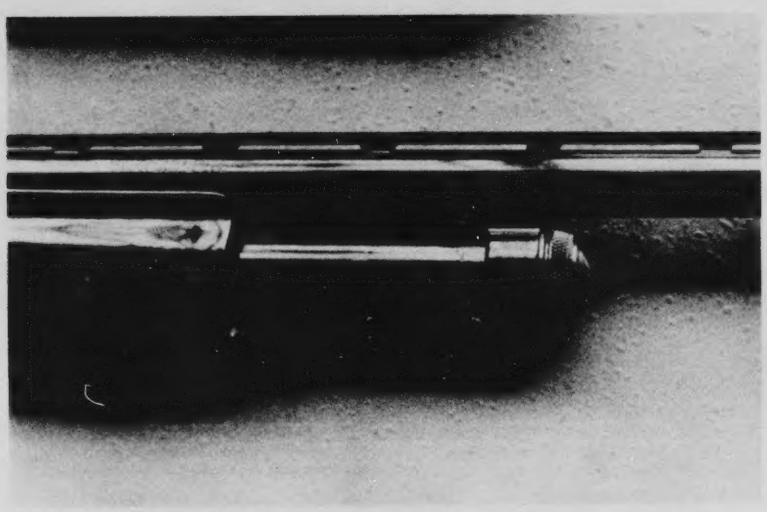


Fig. 14.4. *Pump-action Shotgun with Tubular Magazine*
(Courtesy McBride's Gun Store, Austin, Texas)

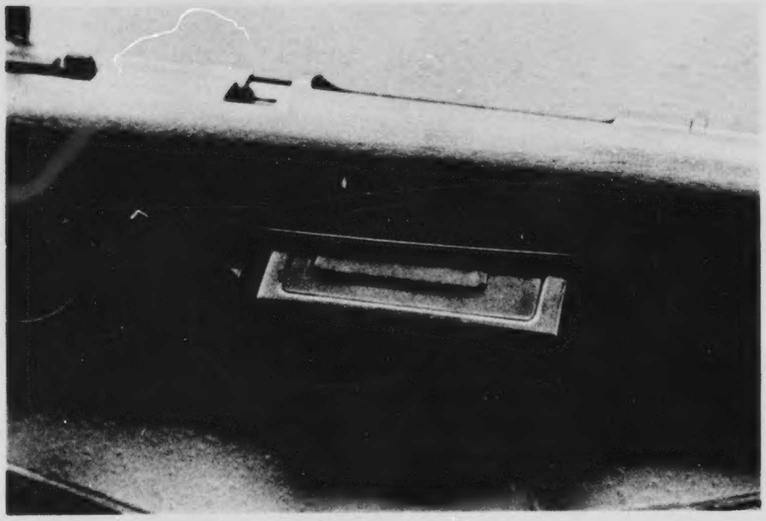


Fig. 14.5. *Bolt-action Shotgun with Clip Magazine*
(Courtesy McBride's Gun Store, Austin, Texas)

of metal covers the top of the clip. The first shell is pushed against the metal so it will go down far enough to allow the shell into the clip. The clip is usually grooved to allow the base of the shotgun shell to slide to the back of the clip. This groove then holds the shell in place. The second shell is pushed against the first loaded shell. The metal plate that covered the clip is pushed farther down. This allows the first shell to be pushed deeper into the clip so the second shell will also fit. The clip is then placed back into the gun.

When the bolt is pulled back, the top shell in the clip is slightly raised. As the bolt is pushed forward, the bolt contacts the base of the shell and pushes it into the chamber. The gun is then ready to fire.

Top-Break-Action Guns. Top-break-action guns do not have a magazine. The shells are loaded directly into the chamber of each barrel. A shooter using a double-barreled gun has a second shot available in the second barrel. A single-shot shotgun must be reloaded for each shot.

The Receiver

The receiver of a shotgun is the metal housing that covers the breech of the gun. It contains most of the mechanism of the action. One might say that the receiver begins where the stock ends, and it ends where the barrel begins. The receiver differs somewhat with each type of shotgun action.

On pump-action and autoloading action shotguns, the receiver is a solid metal housing. This housing contains the mechanism that moves the shell from the magazine to the chamber. It also contains the cocking mechanism, firing pin, safety, extractors, and ejectors. The trigger guard is attached to the bottom of the receiver. The loading port and ejection ports are cut into the receiver. They allow new shells to be loaded into the magazine and spent shells to be ejected from the gun.

Single-shot and double-barreled shotguns have what is called a top-break action. The receiver on these guns is divided into two parts. One part is attached to the stock, the other to the barrel. The part of the receiver attached to the stock contains the firing mechanism, including firing pin and springs. It also contains the safety. On top of this part of the receiver is the lever that unlocks the action. The part of the receiver attached to the barrel contains locking lugs and shell extractors and ejectors.

The receiver in a bolt-action shotgun is one piece of metal. It is permanently attached to the barrel. It contains the trigger mechanism and the safety. The bolt, which contains the cocking mechanism and the firing pin, fits into the receiver but is not a part of it. Also, the clip fits into the lower part of the receiver but is not a part of it.

The Stock and Fore-end

The *stock* and *fore-end* are two wooden pieces found on a shotgun. The metal parts fit inside these. The stock on a bolt-action shotgun is all one piece with no separate fore-end. On autoloaders, pumps, and all top-break-action guns, the stock and fore-end are separate. These two pieces of wood are often used to "dress up" a gun. They also are functional and play an important role in the gun's operation.

The Stock. The traditional wood for shotgun *stocks* is walnut. Several grades of walnut exist and all can be polished or oiled to a nice finish. The better grades of walnut have distinct and unusual patterns. These grades are usually optional, even on guns that cost over a thousand dollars. A high-grade walnut stock can increase the price of a gun by hundreds of dollars.

The supply of walnut wood is not as great as in the past. Therefore, walnut is becoming more expensive. Some gun manufacturers are looking for suitable substitutes for walnut wood. Some inexpensive guns are now produced with stocks made of some other hardwood or plastic. These stocks are serviceable but do not have the beauty of a walnut stock. Some stocks are highly polished and have a glossy finish when they come from the factory. Some shooters prefer that the stock be well oiled and rubbed to a warm, but not glossy, finish.

A gun stock may or may not be *checkered*—that is, ornamented with diamond-shaped projections and grooves. Most have some type of checkering. Lower-priced and moderately priced guns usually have stocks that are machine-checkered. This may even be true of some expensive guns. Hand-checkering, in varying grades, is usually an option that increases the cost of the gun.

Shotgun stocks are usually one of two shapes (see fig. 14.6). The *pistol grip* stock has a grip behind the trigger that resembles the handle of a pistol. However, the grip does not have quite the same drop of a pistol handle. The other handle style is called a *straight grip*. This handle gently slopes back from the receiver and is easily distinguished from the pistol grip handle. A stock may or may not have a cheekpiece. This is an area on the side of the stock, higher than the rest of the stock. When the shooter's head is lowered to aim down the barrel, the cheek naturally rests on the cheekpiece.

A good-quality stock will show evidence of good workmanship where the metal and wooden edges meet. There should be no gaps or uneven spots at this point. Some manufacturers put a recoil pad on the stock, while others do not. Those who do not install a recoil pad will put a plastic or hard rubber butt plate on the stock. Most shotguns have a grip cap plate at the base of the pistol grip on the stock. This helps to protect the wooden stock.

The stock is very important in determining how successfully a person shoots a shotgun. The fit of the stock determines how correctly the gun is positioned against the shooter's cheek and shoulder when it is raised to be fired. A properly fitted stock will fit the shooter's grip. It will also match the shooter's arm, from the trigger finger to the shoulder. This is called the "length of pull." A properly fitted stock will also cause the shooter's head to be in the right position when the gun is brought to the shoulder.

Experienced skeet and trap shooters understand the importance of fit. They will often add recoil pads or stock extenders to make the stock fit. Some attach high cheekpieces for a better fit. Your customers may not go to these extremes, but you should help them find the gun that best fits their specific physical features.

The Fore-end. The *fore-end* or *forearm* is also an important part of the shotgun. Most of what has been said about the stock also applies to the fore-end. This includes information about

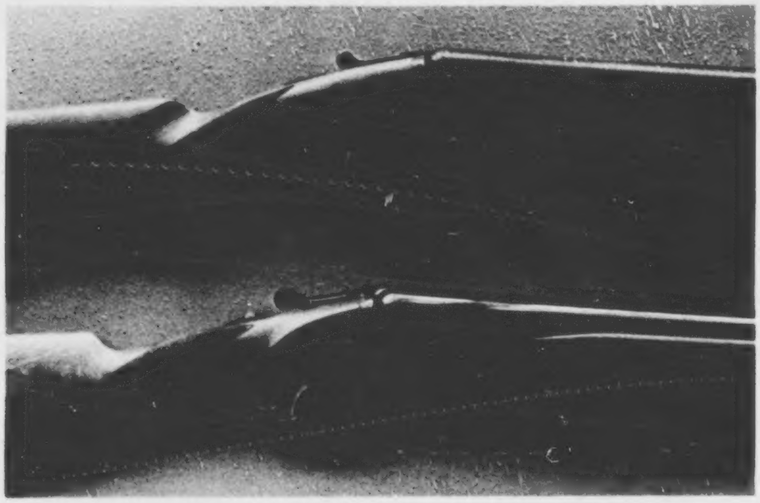


Fig. 14.6. Straight and Pistol Grip Stocks on Double-barreled Side-by-side Shotguns (Courtesy McBride's Gun Store, Austin, Texas)

types of wood used, finishes, checkering, and other forms of workmanship. The fore-end is important for different reasons on different guns. In top-break-action guns, the fore-end contains a locking mechanism that helps secure the barrel. The fore-end on most autoloaders and pump-action guns houses the magazine and, often, some of the gun's action. The fore-end on most pump-action shotguns is grooved or cut in a way that makes it easy to hold as the shooter works the action.

On top-break-action guns, fore-ends are usually of two types (see fig. 14.7). Modern shotguns have a wide and fairly massive fore-end, called a *beavertail.* Older single-shot shotguns and over-and-under guns have a narrow fore-end, known as a field fore-end.

Shotgun Actions

Shotgun manufacturers have several actions from which to choose when designing a shotgun. Some are very simple and others are more complex. Some are more popular than others. The main actions used today are the semiautomatic (autoloading), pump action, bolt action, and break action. This section contains a discussion of each of these actions.

Autoloading Shotguns

Autoloading shotguns automatically eject the fired shell, insert a live shell into the chamber, and ready the gun for another shot each time a shell is fired. Since the shooter does nothing to ready the gun for the next shot, this type of action is called autoloading.

Some call a shotgun with this action an automatic shotgun. However, the shotgun is not actually automatic. On an automatic gun, the gun continues to fire as long as the trigger is depressed. An autoloading shotgun fires only once each time the trigger is pulled.

Most autoloading shotguns are *gas-operated* (see fig. 14.8). A few are mechanically operated. In a gas-operated autoloading action, two things happen when the shooter fires at a target. When the powder in the shotshell explodes, it forms a gas which is used to push the shot through the barrel and toward the target. At the same time, some of the gas is diverted into a chamber where it pushes against a spring-loaded rod or lever. This causes the rod or lever to move and to pull the fired shell out of the chamber. The shell is ejected through a hole in the action housing. As the tension of the spring forces the rod back to its original position, the

Fig. 14.7. Beavertail and Field Fore-ends on Over-and-under Shotguns
(Courtesy McBride's Gun Store, Austin, Texas)

Gas-Operated Autoloading System

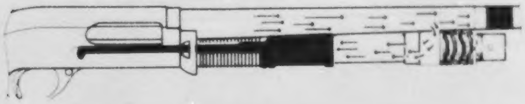


Fig. 14.8. The gas-operated automatic loading system smothers recoil. None of the gun's power is lost, but much of the recoil force is taken up in the reloading action. It has about half the recoil of a conventional gun.

action of the rod forces a live shell from the magazine and places it in the chamber.

This all happens so quickly that it is difficult, if not impossible, for the eye to follow the action. In fact, it happens so quickly that a hunter can usually fire three shells as quickly as the trigger can be pulled.

An added advantage of this action is the fact that a gas-operated autoloader does not have as much recoil as guns with other actions. This is because part of the gas has been used to work the action. This reduces the thrust of energy that goes toward the muzzle of the gun and, thus, reduces that recoil or the "kick" of the gun.

When the last shell is fired, the action remains open in most autoloaders. This is convenient because it allows the gun to be used as a single-shot gun, if the shooter wishes. A parent might buy an autoloader for a son or daughter and require that the gun be used as a single-shot gun, until the young shooter is thoroughly familiar with it.

The fact that the action remains open after the last shell is fired is also a safety factor. If a shooter sees that the action is closed, it should always be assumed that a live shell is in the chamber. This is an important feature of most autoloaders. As a salesperson, you should mention this feature to your customers and explain its advantages.

Most autoloaders have a 5-shot capacity. If migratory birds are hunted, the magazine must be plugged so the gun can shoot only three times before reloading.

An autoloader is readied for firing by pulling a lever of bolt that opens the action (see fig. 14.9). If the magazine has been loaded, a live shell will be moved into position when the lever or bolt is pulled back. This also cocks the gun. As the lever moves forward, the shell is fed into the chamber, and the gun is ready to fire. If the hunter expects to shoot immediately or expects to have to act quickly later on, a live shell is put into the chamber and the safety is engaged.

The safest way to handle the gun is to keep the action closed and to load only the magazine. Do not put a shell in the chamber. When a target appears, the shooter can quickly work the bolt or lever and ready the gun for the first shot. If used as a single-shot gun, the gun's magazine is not filled. This means that the action will stay open after each shot. The hunter inserts a live shell into the chamber. Then, a button is pushed to close the action, and the shotgun is ready to fire.

Some autoloaders have a feature called a magazine cutoff. This device makes it possible to remove and replace the shell in the chamber without disturbing the shells in the magazine. The shooter is able to lock the magazine in position so the shells will not advance when the action is opened.

This is a good feature. A hunter may be shooting at teal with shells loaded with number 6 shot (see Assignment 15). If the hunter sees a flock of geese approaching, he can quickly place a heavier load, like a shell with no. 2 shot, in the chamber. If the magazine tried to advance a shell when the action was opened, it is possible that the action could be jammed or that the hunter could not act quickly enough to clear the action and insert the right shell into the chamber.

The Pump Action

The pump action has traditionally been the most popular shotgun action. It is also called the *slide action*. This action is considered by many to be the fastest of all actions, when handled by an experienced shooter. The gun does not have to be lowered between shots, and the hunter can easily keep it aimed in the direction of the target while working the slide action.

The pump action (see fig. 14.10) has a solid receiver. The receiver has *ports*, or openings, for loading and ejecting shells. Some guns have these holes in the bottom of the receiver, so the shooter is not distracted by ejected shells. The magazine is located in the fore-end of most pump-action shotguns.

The *fore-end,* or *forearm,* is the visible part of the shotgun that moves. The shooter slides the forearm back toward the receiver to start the action. When this happens, the spent shell is ejected. At the same time, a new shell is brought out of the magazine and placed in a position where it can easily move into the chamber. Sliding the forearm back also cocks the gun so it is ready to fire as soon as a shell is placed in a position where it can easily move into the chamber. Sliding the forearm back also cocks the gun so it is ready to fire as soon as a shell is placed in the chamber.

As the forearm is moved forward and back to its original position, preparation for the next shot is completed. The action moves the new shell into the chamber of the barrel. The loading and ejection ports are closed, and the gun is ready to be fired.

A shooter should always be cautioned against keeping the trigger depressed while working the action. Most pump-action guns will fire as soon as the forearm is moved to its forward position, if the trigger is depressed while the action is being worked. Carelessness could cause a serious accident.

You will probably find that your store sells a good number of pump-action guns as compared with guns of other actions. These are good, dependable, repeating shotguns. A pump-action shotgun can provide quality, utility, and status at lower cost than an autoloader and much less than most over-and-under shotguns.

Bolt-Action Shotguns

Some shotguns are manufactured with a bolt action. Many bolt-action shotguns were produced in the 1950s and 1960s, but few are on the market today. Most currently manufactured bolt-action guns are advertised as "goose guns," designed for long-range shooting. Some of these guns come in a 10-gauge size and have barrels 35 to 40 inches long.

The bolt action is recognized as the strongest type of shotgun action. For that reason, it is appropriate for use with magnum loads in 10- and 12-gauge guns (see Assignment 15). Other actions will also handle these heavy loads, but the bolt-action shotgun has the strongest action.

A bolt action is simple to operate (see fig. 14.11). A *bolt* (or long, round cylinder) contains the locking mechanism, the cocking mechanism, and the firing pin. A handle sticks out of one side of the bolt. The handle is not usually just an attachment. Ordinarily, it is the same piece of steel that forms that particular part of the bolt.

The handle serves three purposes. When the action is closed, the handle is pushed down and

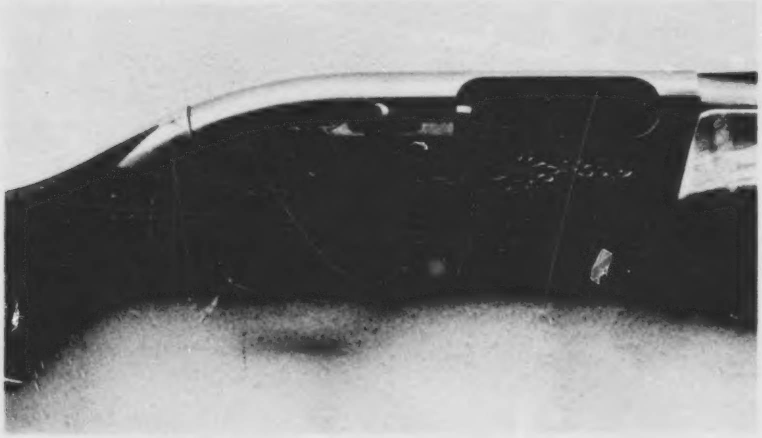


Fig. 14.9. Autoloading Shotgun with Action Open (Courtesy McBride's Gun Store, Austin, Texas)

secured in a gap or slot that is cut into the receiver. This position secures and strengthens the action. The handle would have to be sheared off before the bolt could be blown back toward the shooter by excessive gas escaping through the breech of the barrel.

A second function of the handle is to cock the gun. When the handle is raised so it can clear the receiver and be pulled back, the gun is automatically cocked. The bolt is not a solid piece of steel, but is part of a larger piece that is rotated as the handle is moved. When it rotates as the handle is raised, the gun is locked.

The third function of the handle is to move the bolt. When the bolt is moved back, extractors on the end of the bolt pull the shell from the chamber. At the same time, a live shell is brought into position to be moved into the chamber. As the bolt is moved forward, the shell is pushed into the chamber. Locking lugs on the bolt secure it when the handle is pushed down. The gun is then ready to fire. The bolt serves as a breech block since the front of the bolt contains a hole through which the firing pin travels as it moves forward to fire the shell.

The bolt-action shotgun is not as popular as autoloaders and some other types. It has a rugged action that requires little, if any, maintenance outside of occasional oiling. Since it is usually inexpensive in comparison to other repeaters, the bolt action meets the needs of some shooters who want a repeater but who cannot afford a pump-action shotgun.

Top-Break-Action Shotguns

Top-break-action shotguns are opened by tipping the barrels forward and down, away from the stock. These include most single-shot shotguns, side-by-side double-barreled guns, and over-and-under double-barreled guns.

A top-break-action gun's receiver has two parts. One part is connected to the barrel, the other to the stock. The two parts are joined by a strong bolt that is usually located under the barrel, near the breech.

The part that is joined to the barrel contains the shell extractors and shell ejectors. A good-quality gun will lift the base of unfired shells about an inch from the breech when the action is opened. Fired shells are popped out of the chamber and onto the ground so the chamber is cleared for a new shell. These guns have no magazine and the shells are placed directly into the chamber of each barrel. This part of the receiver also has locking lugs which secure the action, once it is closed.

The part of the receiver that is connected to the stock contains three basic parts of the action's mechanism. First, the lever that is moved to open the action is located on top of the receiver. The firing mechanism is also located in this part. The gun is usually cocked when the action is opened. This is true on hammerless guns, but not on guns with hammers. The trigger guard and trigger are also located on the stock end of the receiver, as is the safety.

Some of the features of the top-break action are discussed in more detail in the following sections.

The Selective Trigger. Most double-barreled guns have two chokes. One barrel, for example, may have a *modified choke* and the other, a *full choke*. The reason for this is that, if a rabbit or other game is seen, the more open barrel can be used first, while the game is closest to the hunter. As a rabbit runs away, or as birds fly away, a tighter choke is needed. The barrel with the full choke can then be fired at the game.

Some double-barreled guns have two triggers, one for each barrel. If this is the case, the hunter can easily fire the barrel of his choice. In some cases, the full-choke barrel might need to be fired first. This is no problem if the gun has two triggers.

Most modern guns have only one trigger. The firing mechanism is built so that, whenever the trigger is first pulled after the gun is cocked, the same barrel will fire. Many shotguns do not allow for this arrangement to be changed. The sequence is always the same. You can see that this might sometimes be inconvenient.

Better shotguns often have a device that allows the shooter to choose the barrel to be fired at any time. This is usually a button that can be moved to one position to fire one barrel and to another position to fire the other barrel. This is a very desirable feature on a double-barreled shotgun. You should be sure to

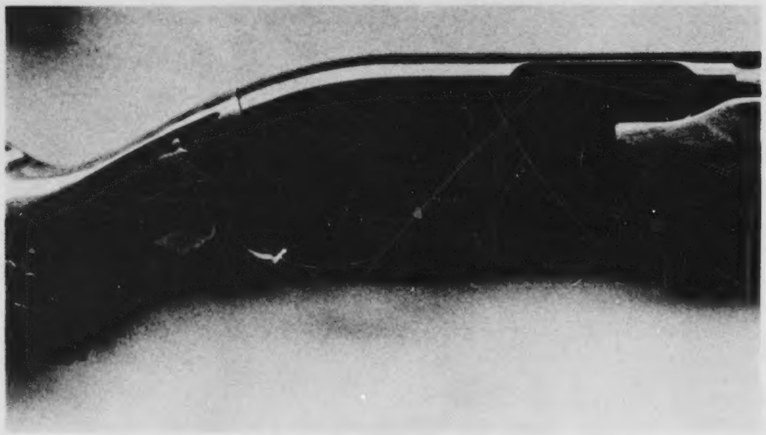


Fig. 14.10. Pump-action Shotgun with Action Open (Courtesy McBride's Gun Store, Austin, Texas)

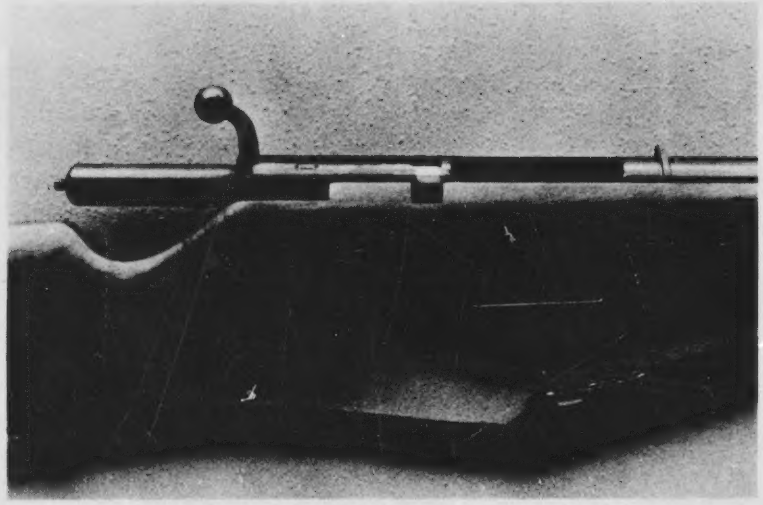


Fig. 14.11. Bolt-action Shotgun with Action Open (Courtesy McBride's Gun Store, Austin, Texas)

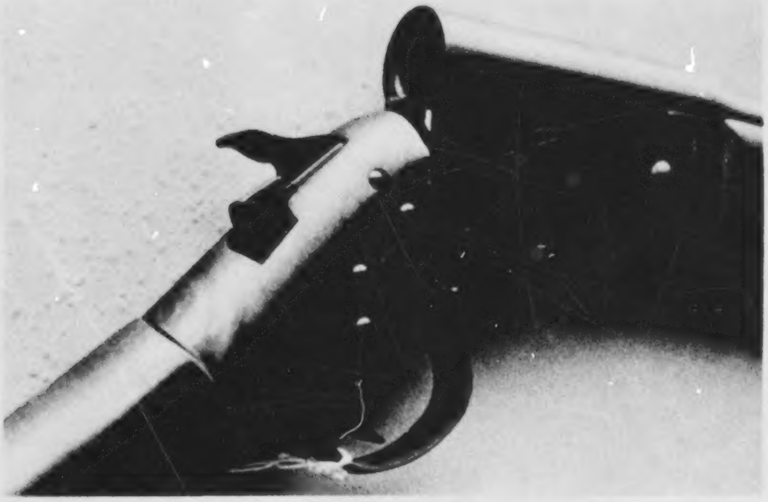


Fig. 14.12. Single-shot Shotgun with External Hammer (Courtesy McBride's Gun Store, Austin, Texas)

explain this to a customer if a shotgun in your store has that feature.

Firing Pins and Hammers. Most modern double-barreled guns are *hammerless.* This means that the firing pins are located inside the receiver. Most single-shot shotguns have a hammer (see fig. 14.12). The hammer must be pulled back before the gun can be fired. Guns with a hammer are not cocked when the action is opened.

Single-shot shotguns with a hammer are considered to be the safest type of shotgun for a beginner. The position of the hammer is always visible, and the shooter can see if the gun is ready to fire.

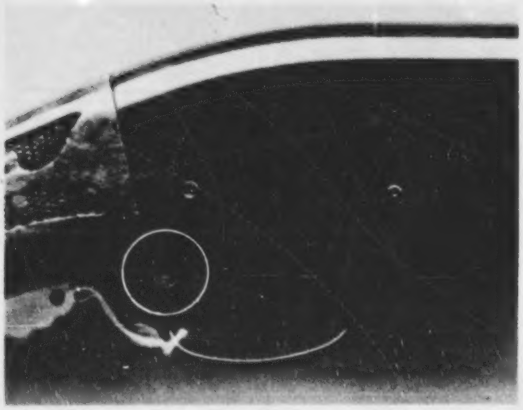


Fig. 14.13. Button Safety on a Pump-Action Shotgun (Courtesy McBride's Gun Store, Austin, Texas)

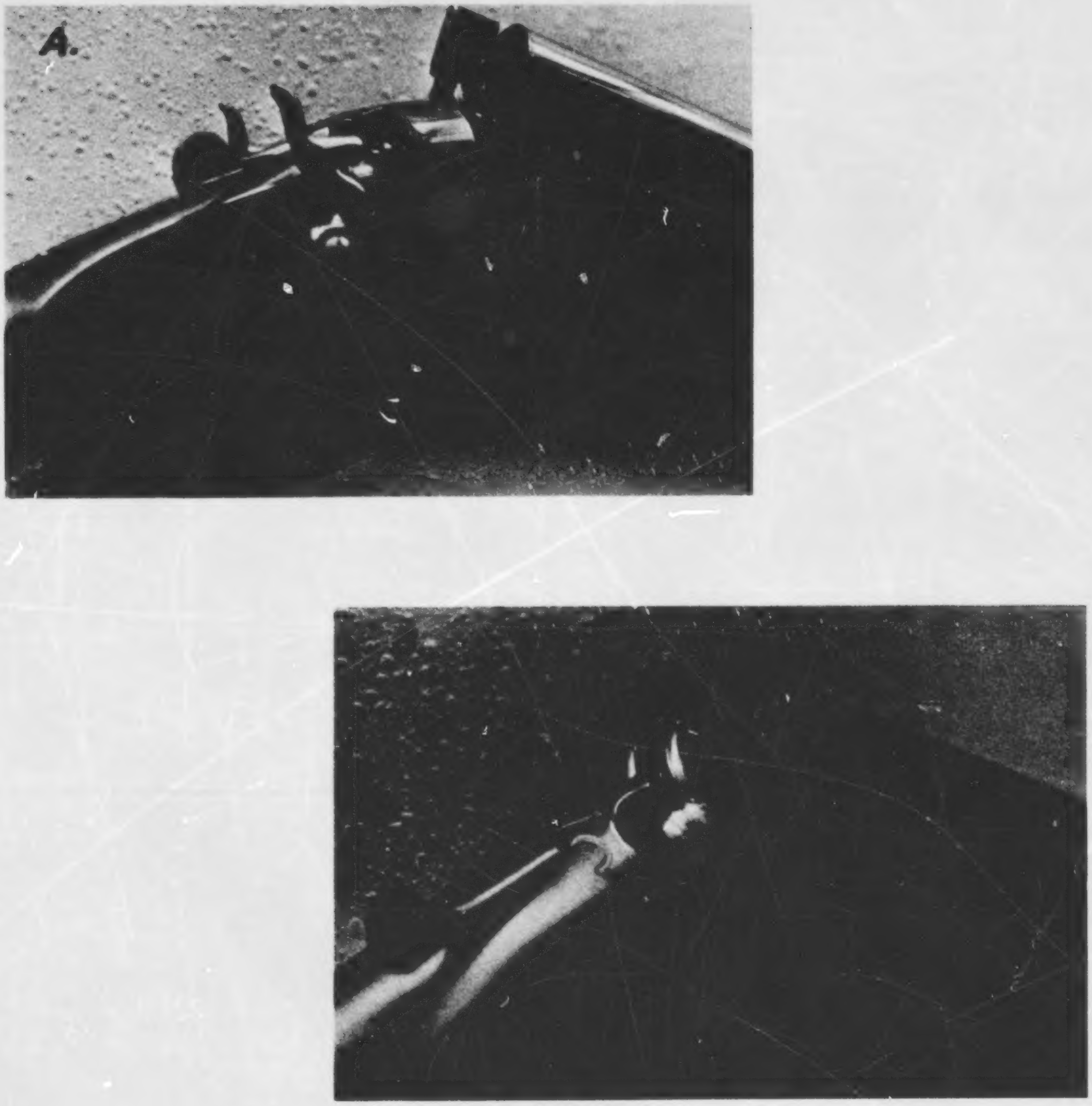
The Safety. Most double-barreled guns have a *safety* located on the receiver. The safety is usually in a position that can easily be reached by the thumb on the hand with the trigger finger. Some guns are automatically put on safety when they are cocked. Others require the shooter to put the gun on safety manually (see fig. 14.13). Hammer-type single-shot shotguns do not usually have a safety button. Many do have a type of safety built into the hammer. In these guns, the hammer is pulled back a fraction of an inch, until it clicks into a locked position. In this position, the hammer is not able to move forward until it is first pulled back to a full cocked position.

The top-break action is an excellent shotgun action (see fig. 14.14). It is durable, not subject to many problems, and is gaining in popularity. For that reason, you should attempt to learn as much as possible about all top-break-action shotguns sold in your store.

Shotgun Gauges

The size of a shotgun *bore* is measured differently from a rifle bore, which is measured by its diameter. A .50 caliber rifle means that the diameter of the bore of that rifle is ½ inch. The

Fig. 14.14. *Top-break-action Shotguns*
A. Double-barreled side-by-side with external hammer
B. Conventional double-barreled side-by-side, hammerless
C. Double-barreled over-and-under, hammerless



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bullet it shoots is called a .50 caliber bullet. A 12-gauge shotgun does not have a bore of .12 inch or even 12 inches. The word *gauge* refers to the size of round lead balls, roughly the size of marbles. A 12-gauge gun has a bore that is the same diameter of a lead ball, 12 of which would weigh one pound. In other words, it would take twelve 12-gauge lead balls to weigh one pound. A 20-gauge shotgun has a bore the same diameter as a lead ball, 20 of which would weigh one pound. As you can see, the higher the number of the gauge, the smaller the bore of the shotgun.

Six different sizes of bores are now used in shotguns. The largest is a 10-gauge. The 10-gauge bore is followed by the 12-gauge, 16-gauge, 20-gauge, and 28-gauge bores. The smallest shotgun bore is the .410. This is really the caliber measurement of the rifle bore. If the .410 caliber were expressed in terms of gauge, it would refer to a 67-gauge shotgun (see fig. 14.15).

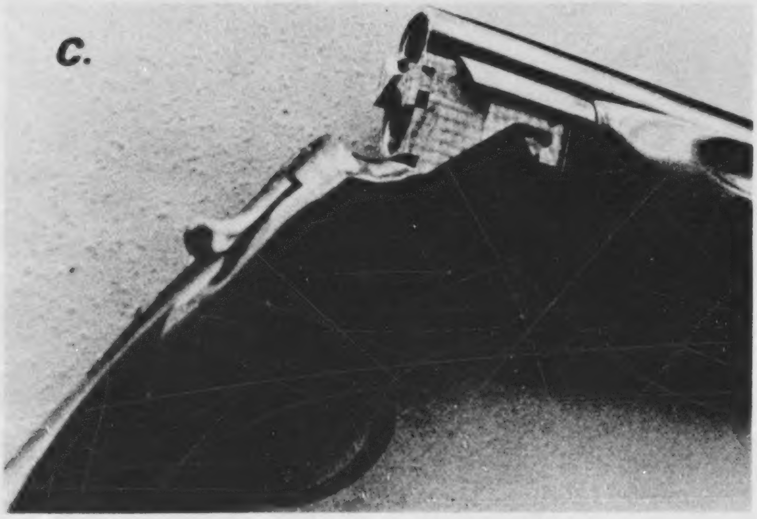
The most popular modern shotgun is the 12-gauge. It is closely followed by the 20-gauge. The 16-gauge shotgun was popular several years ago, declining with the introduction of the 20-gauge Magnum.

Loads for Shotshells

The 10-gauge shotgun is almost exclusively used for waterfowl, although it could be used for most game. Since they are so large, 10-gauge guns must be bigger and heavier than the average shotgun. The 12-gauge is the most versatile of all. It can take a magnum load and kill at very long shotgun ranges. It can be loaded with less powder and used on dove and quail.

Modern ammunition comes in a wide variety of loads. The 20-gauge gun is a deadly weapon on most types of game. The regular 20-gauge loads are good for dove, quail, cottontail rabbits, and other game. A 20-gauge magnum load is sufficient for most upland game. And the 28-gauge gun can be used on small birds and animals.

The .410 shotgun, in the hands of an experienced shooter, can be a satisfactory wingshooting gun. However, many believe that the .410 is a poor choice for a beginning hunter. The reason is that the .410 shell contains fewer shot than shells of any other gauge, which decreases the chances of hitting a flying target. Therefore, many hunters feel that the .410 should be left to the experts who wish to demonstrate their



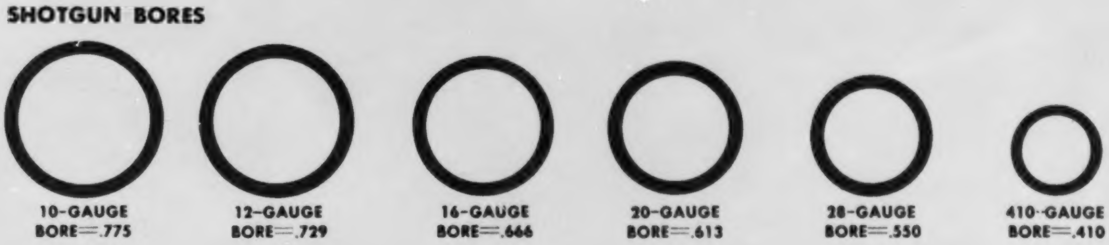


Fig. 14.15.

skills. They say a beginner who uses a .410 may become discouraged because of the number of missed shots.

Questions

1. What limitation does a shotgun have as far as distance is concerned?
2. Which shotgun action has been most popular in the past, and which action is most popular today?
3. Where is the *breech* of a shotgun located?
4. What is the purpose of a *raised rib* on a shotgun?
5. What is a *choke* on a shotgun barrel?
6. What is the *magazine* of a shotgun?
7. The two wooden pieces found on a shotgun hold the metal parts in place. What are their names?
8. What are the four main *shotgun actions* in use today?
9. What is another name given to the pump action?
10. What action is employed by most single-shot shotguns and all double-barreled shotguns?
11. Why is a 12-gauge shotgun called by that name?
12. Explain why it is dangerous to put a 20-gauge shell into a 12-gauge shotgun.

Projects

1. In your school, conduct a survey to see which type of shotgun action is preferred by students in your school.
2. As a separate survey, or along with the project #1 survey, ask students in your school which types of shotguns they own.
3. Draw or find a picture of a shotgun and label all of its parts.

15

Shotshells

***Objectives:** After completing this assignment, you should be able to—*

1. *list the three most significant improvements in shotshells in recent years;*
2. *name the eight basic parts of a shotshell;*
3. *state the purpose of the **wad** of a shotshell;*
4. *describe what a **shot collar** is used for;*
5. *tell why some efforts are being made to require that waterfowl hunters use steel shot; and*
6. *tell what the markings on a shotshell box mean.*

A shotgun shell is correctly called a *shotshell.* The modern shotshell is much improved over those produced even 10 to 15 years ago. Perhaps the three most significant improvements have been the plastic hull, plastic shot protectors, and a new method of sealing the shotshells so all the components stay in place. It is interesting to note that all these improvements were made possible by the use of plastic in the shotshell components.

Parts of a Shotshell

A shotshell consists of eight basic parts—the *metal base, tube, primer, powder, wad, shot collar, shot,* and *crimp.* These parts are identified in figure 15.1.

The Metal Base and Plastic Tube

The *metal base* and the *tube* of a shotshell are made of different materials, but they are permanently joined into one unit. The base is made of metal. Some ammunition manufacturers have experimented with bases made of plastic, but metal bases are still preferred by most shooters. This is especially true of those shooters who reload their own shells.

The base has a hole into which a *primer* is inserted. The base is also where the powder is placed when a shell is loaded. One can tell a lot about the powder of a shell by looking at the length of the base. A longer base usually indicates that a more powerful charge of powder has been placed in the shell. These are often called "high brass" shells since the base looks like brass. Field and game loads usually have a very short base.

The *tube* of a shotshell is most often made of plastic. Paper shells were used until plastic tubes were perfected. A plastic tube has many advantages over a paper tube. Plastic is slicker, and a plastic shell is easier to load or unload. Paper shells were sometimes affected by moisture and would expand just enough to make loading and unloading a gun a difficult job. Plastic shells are more durable.

This is important to the reloader. A plastic shell can usually be reloaded three or four times without any problems. The plastic shell is ideal for use with modern crimping techniques. This helps the shotshell to remain sealed.

The Primer

The *primer* is what gives a shotshell its "start." The primer is a small explosive device that is inserted into a hole in the metal base. It is located in the center of the base of the shell. The exposed end of the primer is hit with the firing pin. The other end contacts the powder that is loaded into the shell. When the firing pin hits the primer, the primer explodes. This, in turn, causes the powder to explode, and the shot is sent on its way (see fig. 15.2).

The Powder

The powder used in shotshells is called *smokeless powder.* It is not completely smokeless, but very little, if any, smoke is visible after a shell has been fired. This powder is fast-burning. It looks like tiny flakes or granules. When the powder explodes, it produces a gas that drives the wad, shot protector, and the shot through the crimp and into and out the gun barrel. The force of this expanding gas is enough to drive the shot forward at speeds of over 1000 feet per second.

This creates very high pressure in a barrel. So, it is important that the barrel is designed to handle this pressure. It is also important that the barrel is free of obstructions. Mud or some other substance can slow the shot long enough for the pressure in the barrel to become dangerously high. The barrel may explode and cause serious injury to the shooter.

The Wad

Wadding is placed between the powder and the shot for a good purpose. The *wad* seals the barrel enough to prevent the gas from the explosion from passing through the shot. As it is, the gas pushes the wad which pushes the shot. If the gas were allowed to go directly to the shot, it is possible that some gas would pass through the shot. This would rob the shooter of

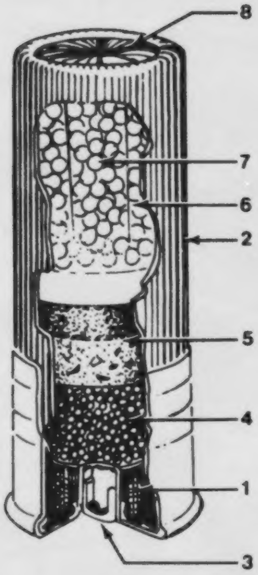


Fig. 15.1. *A Shotshell consists of (1) Metal Base, (2) Tube, (3) Primer, (4) Powder, (5) Wad, (6) Shot Collar, (7) Shot, and (8) Crimp.*

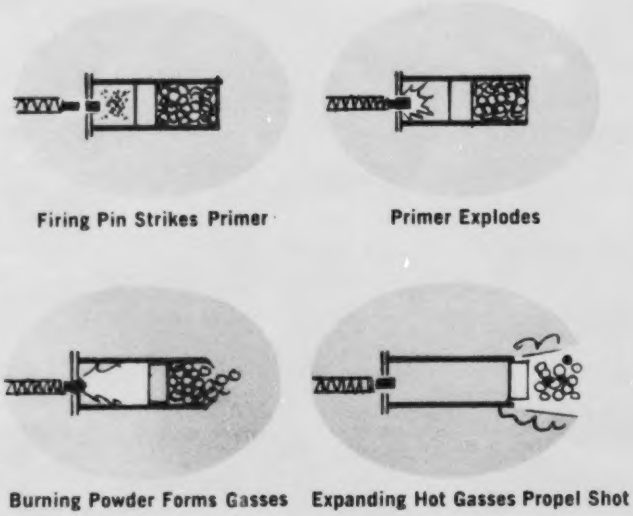

Firing Pin Strikes Primer
Primer Explodes
Burning Powder Forms Gasses
Expanding Hot Gasses Propel Shot

Fig. 15.2. *The Firing Sequence*

some of the power of the shell since not all of the power would be used to push the shot through the barrel.

Another problem would be that the gas would cause the shot to spread in an uneven pattern. The wad stays behind the shot until all the "push" from the gas is gone. The wad then falls away. The shot is still together at this point and can begin to spread apart evenly.

Some shotshells now make the wad and the shot collar into one piece.

The Shot Collar

A tremendous amount of pressure builds up in a shotgun barrel when a shotshell is fired. The shot goes from a stationary position to speeds of over 1000 feet per second, after traveling less than 30 inches down the barrel.

The *shot collar* is used to ensure that the shot is in good shape when it leaves the barrel. Without a shot collar, many of the shot would be flattened or deformed as they moved along the walls of the barrel. A round shot will go farther and stray less than a deformed shot. The shot collar stays with the shot until the push of the exploding gas is gone. It then falls away, and the shot begins to move into its pattern. The shot collar can often be found 15-20 feet away from the muzzle of the shotgun after a shell has been fired.

The Shot

Shot is the name given to the small, round, lead pellets that travel to the target. Shot have traditionally been made of lead. Some effort is being exerted to require that shot used for waterfowl be made of steel. This is because birds often pick up lead shot when eating. The lead can poison the birds if enough shot are swallowed. Some parts of the country have passed laws requiring that steel shot be used for duck and goose hunting. Some concern exists about the effect of the heavy use of steel shot in a shotgun barrel. Another concern is that steel shot are more likely to cause dental problems if a hunter happens to bite on one while eating game.

Shot come in many sizes. The proper size to use will depend upon the type of game being hunted. Smaller shot are used for smaller game. The larger the number assigned the shot, the smaller the shot. The smallest shot shot is no. 9. It is .08 inch in diameter. The largest shot size is no. 00 buckshot. It has a diameter of .33 inch.

Rifled slugs are also used in shotshells. They have about the same diameter as the barrel of the gun in which they are fired. Figure 15.3 includes all the shot classifications and shows how many shot are found in the various shotshell loads.

One point to remember is that the larger the gauge, the more shot that are usually found in a load. A 12-gauge shotshell will usually contain a larger load of shot than a 20-gauge shell.

The Crimp

For many years, the components of a shotshell were held in place by a round cardboard disk at the end of the shell. The mouth of the tube was molded over the disk to keep it in place. This was effective in keeping the components in place. The problem was that the disk could easily cause the shot pattern to be erratic from one shot to the next.

Ammunition manufacturers then learned to put a *crimp* in the end of the tube (see fig. 15.4). This meant bending the tube so that it would hold the components in shape. Crimping was not developed to its present state of perfection until just a few years ago. The plastic shell and the crimping process now used combine to do an excellent job of closing the end of the shell.

Reloaders had difficulty crimping plastic tubes so they would stay crimped. Most modern reloaders do a good job of producing a permanent crimp. The crimp allows the end of the tube to be opened by the edges of the shot collar. The shot are not affected by this, and there is no cardboard disk to disrupt the pattern of the shot. Modern crimping is a major development in shotshell production.

Shell Markings

Shotshell boxes have markings that a salesperson should quickly understand and be able to interpret to a customer. Most experienced shooters are thoroughly familiar with the markings. However, a customer new to

COMPARATIVE SHOT SIZES

		9	8	7½	6	5	4	2	BB	NO. 4 BUCK	NO. 3 BUCK	NO. 1 BUCK	NO. 0 BUCK	NO. 00 BUCK
SIZE		●	●	●	●	●	●	●	●	●	●	●	●	●
DIAMETER IN INCHES		08	09	095	.11	12	.13	.15	.18	.24	.25	.30	.32	.33
		Approximate number of pellets per load												
OUNCES OF SHOT TO THE SHELL	1⅞					318	252	168	93					15
	1⅝				366	276	219	146	81	41				
	1½			525	337	256	203	135						12
	1⅜				309		186	124	69			16	12	
	1¼	731	513	438	281	213	169	113	63	27				
	1³⁄₁₆						160							
	1⅛	658	461	394	253	191	152	101				12		9
	1	585	410	350	225	170	135	90			20			
	⅞	512	359		197	149	119							
	¾	439		263	169	128	101							
	½	293		175	113	85	68							

Fig. 15.3.

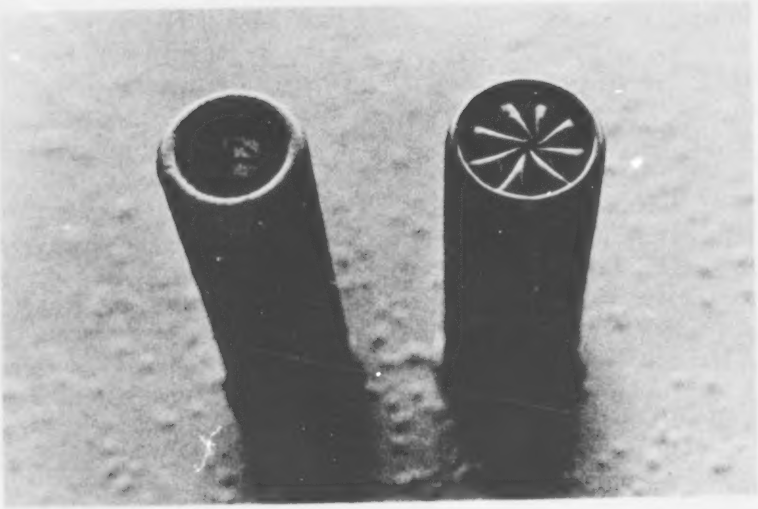


Fig. 15.4. *Roll vs. Folded Shotshell Crimps. The early style of shotshell crimp, with overshot card wad held by rolled shell mouth, sometimes produced patterns blown or disturbed by the lagging card wad. The new folded crimps eliminate the disturbance of the shot string and maintain even pressures and velocities. (Courtesy McBride's Gun Store, Austin, Texas)*

shooting and hunting may need some explanation.

Most shotshells also have the same markings. The markings identify the gauge of the *gun in which the shell is to be fired* and the length of the chamber the gun should have. The markings also identify the weight of the powder load, the weight of the shot load, and the size of shot that were loaded into the shell. For example, a shell marked "12 Ga 2¾ in. 3½ 1¼ 7½" tells the shooter the following information:

- The shell is designed to be fired in a 12-gauge gun.
- The shell is made for a gun with a chamber that is 2¾ inches in length. The unfired shell is actually just under 2½ inches long. When the shell is fired, the crimp unfolds, and the shell is then no longer than 2¾ inches.
- The shell contains enough smokeless powder to produce a muzzle velocity equal to that produced by using 3½ drams of black powder. *Muzzle velocity* refers to the speed of the shot at the time it leaves the barrel. The black powder reference is a holdover from the days when black powder was used. Sixteen drams are equal to one ounce.
- The shell contains 1¼ ounces of shot.
- The size of the shot is number 7½. This shot has a diameter of .095 inch.

Box and shell markings are important in helping a customer identify the proper load to use for a specific shooting purpose. Many ammunition manufacturers use different colors for shotshells. A 12-gauge shell will be of one color, a 16-gauge shell of another color, and so on. This is a good safety feature.

Some hunters use different guns from one hunt to the next. It is possible that a 20-gauge shell could be left in a hunting coat pocket when the 12-gauge gun was being used. If the 12-gauge shell is red and the 20-gauge shell is yellow, the hunter is not likely to make the mistake of putting the 20-gauge shell into the 12-gauge gun.

Types of Loads

Another marking found on most shotshell and shotshell boxes refers to the type load of the shell. The shell *load* is actually a combination of powder and shot. These combinations are varied, and each combination has a specific name. The names may vary slightly from one manufacturer to another. The shotshell classifications most often used are *magnum, field, game,* and *target.* Most manufacturers produce at least one load in between the magnum and the field load.

Magnum Loads

The most powerful shotshells are called *magnum* shells. This is because they contain more powder than other shotshells. Most 12-gauge Magnum loads have a powder designation of 4 drams equivalent (equivalent to 4 drams of black powder). The next-highest load, from most manufacturers, is 3¾ drams equivalent.

The 12-gauge 3-inch magnum shell normally contains 1⅝ or 1⅞ ounces of shot, depending upon the size of the shot. The 12-gauge 2¾ shells usually contain 1½ ounces of shot. Three-inch Magnum shells for the 10-gauge gun contain up to 4¾ equivalent drams of powder and 2 ounces of shot.

High-powered Loads

Each ammunition manufacturer has its own name for the high-powered shells it produces. These are not quite so powerful as the magnum loads. They are called Express, Long-range, High-velocity, Super, and High-power by the respective manufacturers. These shells are not Magnum shells and are 2¾ inches in length. The one exception is the 10-gauge shell that is 2⅞ inches in length.

High-powered loads in 12-gauge shells usually contain 3¾ drams equivalent of powder and 1¼ ounces of shot. Many hunters prefer to use high-powered shotshells for all hunting purposes.

Field Loads

Field loads usually contain 3¼ drams equivalent of powder. The amount of shot varies according to the manufacturer. The smallest amount of shot used in this type of load is one ounce. The largest load of shot is 1¼ ounces. Most have 1⅛ or 1¼ ounces, depending upon the size of shot used.

GAME	SHOT SIZE	GAUGE	OUNCES OF SHOT[1] (Load)	CHOKE	BARREL LENGTH
Turkey, Geese, Fox	BB, 2, 4	12, 16 20	1¼ 1 3/16	Mod. or Full	28″ to 32″
Ducks (Pass Shooting)	4, 5	12, 16 20	1¼ 1 3/16	Mod. or Full	30″ or 32″
Ducks (Over Decoys)	6, 7½	12 16, 20	1⅛ 1	Mod.	26″ or 28″
Pheasants	6	12 16, 20, 28	1⅛ 1	Mod. or Imp. Cyl.	26″ or 28″
Sage Grouse, Prairie Chicken	6, 7½	12 16, 20, 28	1⅛ 1	Mod. or Imp. Cyl.	26″ or 28″
Squirrel, Rabbit	5, 6	12, 16 20, 28, .410	1 ¾	Mod.	28″ or 30″
Partridge, Grouse	6, 7½	12, 16 20, 28, .410	1 ¾	Mod. or Imp. Cyl.	26″ or 28″
Quail, Doves	7½, 8	12, 18 20, 28, .410	1 ¾	Mod. or Imp. Cyl.	26″ or 28″
Woodcock, Jacksnipe, Rail	7½, 8, 9	12, 16 20, 28 .410	1 ¾ ½	Imp. Cyl.	26″ or 28″
Trap	7½, 8	12	1⅛	Full, Imp. Cyl. or Mod.	30″ to 34″
Skeet	9	12, 20, 28, .410	½	Skeet	26″ or 28″
Deer	Rifled Slug or 00 Buckshot	12 16 20	1 ⅞ ⅝	Mod., Imp. Cyl. or Special	26″ to 32″

(Courtesy Browning Arms Co.)

[1] *Minimum load recommended. In most cases, heavier loads are available.*

Fig. 15.5. *Recommended Specifications for Various Game*

Game Loads

Some ammunition manufacturers produce shells designated as "game load," while others do not. One manufacturer produces a game load shotshell in 12-gauge that has 3¼ drams equivalent of powder and 1 ounce of shot. Another produces a long-range game load that has 3¾ drams equivalent powder and 1¼ ounces of shot. This manufacturer does not produce a standard game load.

Target Loads

Target loads refer to those used for skeet and trap shooting. These loads include a large number of combinations of shot and powder. The hunting equipment salesperson should study literature and charts provided by the various ammunition manufacturers for current information on target loads.

Matching Gauges, Shotshells, and Game

It is important for a person to use the right tools for every job. A mechanic who tries to do all repair jobs with a screwdriver and a pair of pliers will soon be out of business. Hunting and target shooting also require that the right equipment be used if the shooter is to be successful. To use a .410 shotgun while trying to shoot geese that are flying 40 yards high would be foolish. So would shooting squirrels with rifled slugs. Selection of a gun and the proper ammunition for that gun should depend upon who is to use the gun and the target he or she is trying to hit.

It is impossible for even the experts to fully agree upon the proper gun and the proper loads for all shooters and all game. Figure 15.5 is a good general guide to use in advising customers about shotguns and shotshells to use for various game.

Questions

1. What are the three most significant improvements in shotshells in recent years?
2. What are the eight basic parts of a shotshell?
3. What is the purpose of a *wad* in a shotshell?
4. Without a *shot collar* what would happen to the shot when the gun is fired?
5. Why are some efforts being made to require waterfowl hunters to use steel shot?
6. What do the markings on a shotshell box tell a shooter about the shells in the box?
7. Define the term *load*, and give the classifications of loads.

Projects

1. Make a chart of all shotgun ammunition carried by your store. For each classification (Magnum, field, etc.), indicate the amount of powder and the amount of shot used by each manufacturer.
2. Do a report on how shot are manufactured. Try to find out if there are any old shot towers in your area.
3. Do a report on how gunpowder is manufactured.

16

Rifles

Objectives: *After completing this assignment, you should be able to—*

1. *give Webster's definition of a rifle;*
2. *list the three major classifications of rifles;*
3. *tell how to match bullet size with the rifle barrel;*
4. *tell what* ***rate of twist*** *means;*
5. *state which rifle action is the most accurate;*
6. *give the cartridge caliber that the greatest number of autoloading rifles are made to fire;*
7. *name one of the most popular of all rifle actions; and*
8. *define a bullet's* ***trajectory.***

A rifle is designed for accuracy. When a rifle is fired, the shooter intends to hit a specific spot on a target. Even the formal definition of the word "rifle" refers to accuracy as the purpose of the rifle's design. *Webster's Dictionary* defines a rifle as "a firearm having upon the surface of its bore spiral grooves to impart rotary action to the projectile, insuring greater accuracy of fire." The rifled barrel will be discussed in greater detail later in this assignment.

The rifled barrel is the major difference between a rifle and a shotgun. Another big difference is that the rifle shoots only a single bullet, while a shotgun shoots from 200-300 shot at the target. Other differences, such as the fact that a rifle has front and rear sights, will become apparent as you study this assignment.

Rifle Classifications

Rifles might be classified in one of two ways. First, a rifle is classified according to its action, such as bolt action, lever action, and so on. Most people tend to classify rifles according to the caliber or the size of bullet they shoot. Three major classifications are used—rim-fire rifles, varmint rifles, and big-game rifles. Some calibers are versatile enough to cross classification lines.

Rim-fire Rifles

Rim-fire rifles are, for the most part, .22 caliber rifles. One exception is the 5 mm Remington Magnum. Most people look upon the .22 as the proper "first rifle" for a beginning shooter for two good reasons. First, the gun does not "kick." This enables a new shooter to learn to shoot without having to worry about recoil. Recoil or "kick" causes most shooters to shut their eyes or to flinch when shooting.

A second advantage of the .22 rifle is that it is inexpensive to shoot. Usually, a shooter can fire a .22 rifle about 12 times for what it costs to fire a .30-06 caliber rifle one time.

Rim-fire rifles employ all the actions used in rifles. They are made in autoloading, pump, bolt, lever, and break actions. Rim-fire rifles are usually moderately priced in comparison with rifles that shoot center-fire cartridges. Most .22 rifles are considered to be inexpensive. Some, however, can cost several hundred dollars.

The customer can find a .22 rifle to match almost any degree of shooting experience. These may range from a modest single-shot rifle to a very fine target rifle. The .22 rifle is used for all types of shooting. It is a good caliber for plinking at tin cans and small targets. It is also an excellent caliber for small game animals like rabbits and squirrels. It is a good varmint rifle for distances of 50-75 yards. Finally, it is an excellent target rifle. The rim-fire 22 cartridge is considered to be one of the most accurate of all cartridges.

Varmint Rifles

Varmint rifles are used mainly for small animals that are hard to approach. Woodchucks, prairie dogs, and other such animals are often very wary. Anyone approaching within a hundred yards of one of these animals may cause the animal to dive into its burrow. Varmint rifles are designed for long-range shooting.

Most of the .22 caliber center-fire cartridges, usually flat-shooting, are used in varmint rifles. This means that the bullet drops less over a given distance than with other calibers. The .25-06, .22-250, .222, .243, and .22 Hornet are good examples. The .270 cartridge is also used in varmint hunting by some hunters. Varmint rifles usually have a bolt action.

The varmint rifle is not designed for "walk-up" hunting. The barrel is very heavy, and the fore-end is usually wider than those on most hunting rifles. These features help the shooter to aim from a shooting rest with great accuracy. Because of the added steel and other special features, varmint rifles often cost more than standard hunting rifles. These rifles are almost always fitted with a telescopic sight.

Big Game Rifles

Most people think of big game as any animals from the size of a deer to the size of an elephant. However, not all guns in the big-game category are designed for elephant. Neither are elephant guns intended to be used for deer.

Some rifles chambered for center-fire cartridges of less than .30 caliber are used for big game. The .243 is an excellent cartridge for deer. The .270 can be used for game up to the size of elk and moose. Most big-game rifles are chambered for .30 caliber cartridges. Dangerous African game animals are often hunted with rifles in the .40, .50, and .60 caliber cartridges.

Also, big-game rifles used on most American game often are fitted with telescopic sights. Guns used for dangerous African animals usually have open sights for fast aiming during a charge by a lion or elephant.

Most calibers offer a variety of bullet weights to the shooter. This enables the same gun to be used for different game. For example, a hunter might want to use a 130-grain bullet in a .30-06 rifle while deer hunting. When bear hunting, the same hunter would probably use the same rifle but load it with cartridges containing 220-grain bullets.

The Parts of a Rifle

Since a rifle and a shotgun have the same basic parts, you should first study Assignment 14 which includes a discussion on the parts of a shotgun. Many of the facts related to the parts of a shotgun also are true for the parts of a rifle. In this assignment, we will add any necessary information on rifles.

For example, rifle magazines often are designed to hold more cartridges than are shotgun magazines. This assignment deals mainly with the "extra" kinds of information for each part of the rifle (see fig. 16.1).

The Barrel

A rifle barrel is *rifled*. This means that, after the bore is drilled through the steel that forms the barrel, the walls of the barrel are grooved (see fig. 16.1). This is accomplished in one of two ways. The first is called the "button" process. In this process, a piece of tungsten carbide is pushed through a new barrel. Since this piece of metal is larger than the bore of the barrel, it is pushed through with great pressure, during which the rifling grooves are pressed into the walls of the barrel.

The other rifling process involves using a small, hooklike blade. Each groove is formed after the tool has been used several times to cut away thin strips of steel from the walls of the barrel. The depths of the grooves may vary from one caliber to the next. The grooves on a typical .30 caliber barrel are .004 inch deep.

The bullet used in any rifle must have a diameter equal to the *groove diameter* of the barrel. This means that a bullet used in a .30 caliber barrel must have a diameter of .308 inch since the grooves on the two sides have a combined depth of .008 inch.

There are two reasons for this. One is that the gas from the exploding powder will escape around the bullet if the bullet does not fill the grooves in the barrel. Another reason is that the

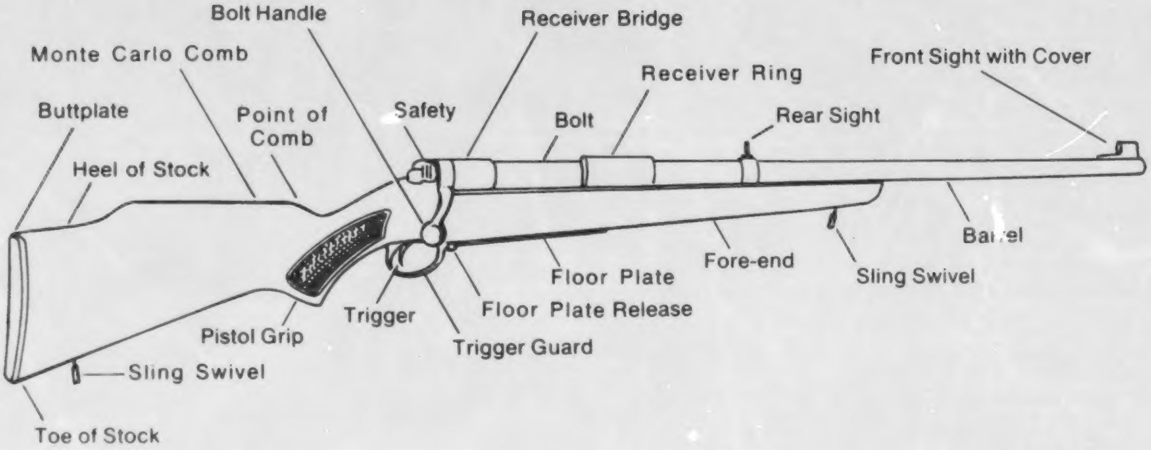

Bolt Handle
Receiver Bridge
Monte Carlo Comb
Front Sight with Cover
Receiver Ring
Buttplate
Point of Comb
Safety
Bolt
Rear Sight
Heel of Stock
Barrel
Fore-end
Floor Plate
Sling Swivel
Floor Plate Release
Trigger
Pistol Grip
Trigger Guard
Sling Swivel
Toe of Stock

Fig. 16.1. *Major Parts of a Rifle*
(Adapted from drawing in Outdoor Life, *September, 1979)*

bullet must be pressed hard against the lands (ridges) on the walls of the barrel if it is to have the spinning action so necessary for accuracy. When a rifle bullet leaves the barrel, it may be spinning as fast as 250,000 revolutions a minute. It is this spinning action that keeps the bullet going in a nose-first position. Without the spin, the bullet would tumble end over end.

The barrel of a rifle may range from 20 to 28 inches in length. The length alone does not affect the accuracy of the rifle. However, a longer barrel provides a longer sight radius and may contribute to accuracy in this manner.

One important point a gun salesperson should know concerns proper barrel length for various cartridges. Some loads, especially magnum loads, have a lot of powder in relation to the size of the bullet. Since powder used in rifle cartridges is considered to be "slow-burning," a longer barrel is needed so that the bullet will not leave the barrel before all the powder has burned. If the bullet leaves the barrel too soon, it will not receive all the "push" the load was intended to give.

The *rate of twist* is another term used when people talk about rifle barrels. This refers to how many inches a bullet must travel in the barrel before it makes one complete revolution. Long and heavy bullets usually require a faster rate of twist than smaller bullets. A .30 caliber rifle may have a rate of twist that causes the bullet to revolve once every 10 inches. Rifles for smaller calibers may cause the bullet to revolve one time after traveling 14 or 16 inches through a barrel.

In summary, the barrel is the part that really makes a rifle different from a shotgun. An

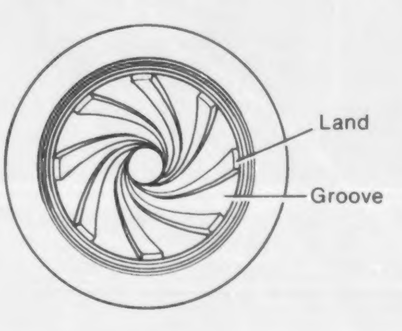

Land
Groove

Fig. 16.2. *Raised lands cut into the bullet and impart spin as the bullet moves down the rifled barrel. (Adapted from drawing in* Outdoor Life, *September, 1979)*

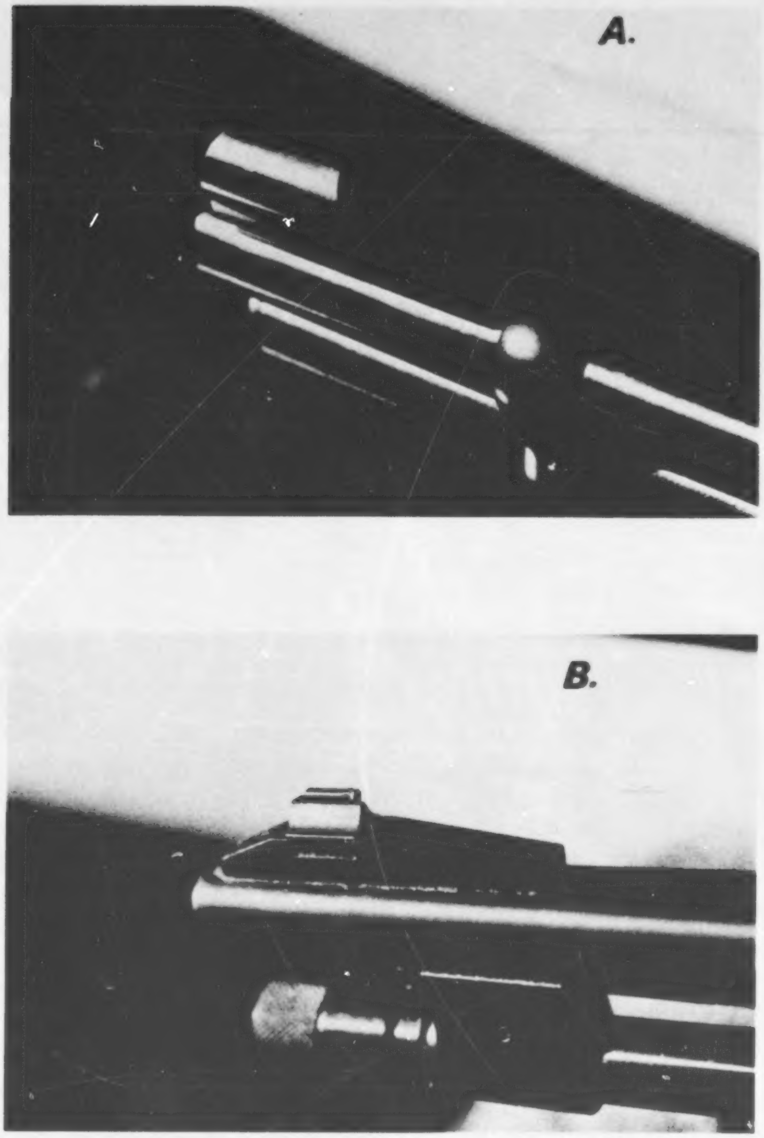


Fig. 16.3. *Rifle Sights*
A. Hooded Front Sight B. Open Front Sight
(Courtesy Oshman's Sporting Goods, Austin, Texas)

added point is that the barrel must be strong to safely control the tremendous pressure that builds up as the gases push the bullet toward the muzzle.

The Sights

The *sights* of a rifle are sometimes considered as part of the barrel, but they are actually separate. These devices are added to a rifle barrel. Most types of sights offer the potential for accurate shooting. Some are easier to use than others, and some are adjustable for accuracy. Three basic types of rifle sights are available.

Open Sights. An open sight consists of a rear and a front sight. The front sight is usually a blade or bead-type fixture (see fig. 16.3). The rear sight is usually shaped almost like a rectangle but has a notch removed from the top (see fig. 16.4). The rifle is properly aimed when the front sight "fits" into the notch in the rear sight while it is centered on the target. The main problem is being able to focus on the rear sight, front sight, and the target at the same time. This is usually impossible to do. Experts advise that the eye should focus primarily upon the sights for best accuracy.

Most rifles that come from the factory are equipped with open sights. They are inexpensive to make and are sturdy enough to withstand most "knocks" that a rifle will take. Open sights are used on most big guns used for water buffalo and other dangerous game. During a charge by a lion or elephant, the hunter must be able to aim very quickly. Open sights make this possible.

Peep Sights. A peep sight (see fig. 16.5) consists of a round rear sight with a small hole through the center. At the front of the barrel is a bead-type sight. The shooter "peeps" through the hole in the rear sight. The bead of the front sight is centered in the ring that the shooter sees when looking through the rear sight. The bead of the front sight is then placed on the target and the gun is fired. Peep sights are considered to provide more accuracy potential than open sights.

Telescopic Sights. Telescopic sights make it possible to hit small targets from great distances. Some telescopic sights do not magnify the target, but most do. Many modern telescopic sights have variable power. This means that the magnification of the target may be changed. A 3X-9X scope will magnify the target from three to nine times. Other telescopic sights are built with distance compensators. These allow the hunter to aim directly at a spot he or she wants the bullet to hit, no matter what the distance. Both of these features increase the cost of the scope.

One of the biggest advantages of the telescopic sight is that the shooter does not have to focus on two widely separated objects. The cross hairs of the scope appear to be on the same focal plane as the target. This greatly improves the potential for accuracy. Another advantage of the telescopic sight is its light-gathering power. A hunter looking through a scope at dawn or twilight can see better than with the naked eye.

The Stock

Most of the discussion about shotgun stocks also applies to stocks used for rifles. Bolt-action rifles have one-piece stocks. Two-piece stocks are used on rifles with autoloading, pump, or lever actions (see fig. 16.6). Some break-action single-shot rifles also exist. They also have two-piece stocks.

Walnut wood is the material most often used for rifle stocks. It has long been a favorite because of its weight, durability, and beauty, and it is available in various grades. Most factory stocks are of a standard grade of wood. Some difference in the quality of wood used in the stock can be seen between low-priced and higher-priced guns. Some manufacturers provide customers the option of having a rifle stocked with a better-grade walnut.

Stocks of moderate- and higher-priced rifles usually have some checkering, usually found on the grip and the fore-end. Most checkering is done by inletting machines and is often very good. Sometimes a hand-checkered stock is an available option to a buyer.

Some gunsmiths have experimented with stocks made of materials other than walnut. Some .22 rifles are produced with plastic stocks. The move away from walnut, if it does ever occur, will probably be an economy move. Some gunsmiths have used fiberglass stocks as a means of gaining consistency in the point of impact of bullets fired from a rifle.

Wood stocks are definitely affected by moisture. Some shooters use fiberglass bedding to ensure a good fit of the barreled action into the stock. Others have gone further and used fiberglass stocks to maintain accuracy. Studies show that the fiberglass stocks do help maintain the rifle's accuracy. Most customers, however, are concerned with how the rifle looks. Since walnut is much more attractive than fiberglass, it is likely that walnut stocks will be around for a long time.

Rifle stocks also come with a straight or pistol grip. The straight grip is found most often on rifles with a lever action. Grip caps and butt plates are found on most rifles today.

The Magazine

Most of the magazines used in rifles operate in the same way as those found in shotguns. The *tubular* magazine is used in almost all autoloading and all pump-action rifles. Most lever-action rifles use a tubular magazine, as well as some .22 caliber bolt-action rifles.

The clip-type magazine is used for most bolt-action rifles in .22 caliber. All center-fire bolt-action rifles use a clip magazine as well as some autoloaders.

Fig. 16.4. *Open Rear Sight on a Winchester Model 94 Lever-action Rifle*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

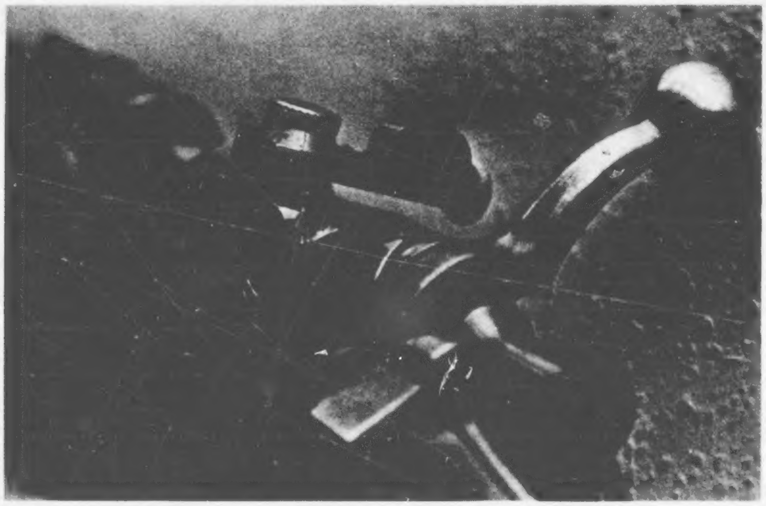


Fig. 16.5. *Peep Sight on .22 Caliber Bolt-action Target Rifle*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

Another type of magazine is the *rotary* magazine. This is not widely used but is found on most Savage lever-action rifles chambered for center-fire cartridges. A rotary-type action is also used in some *Ruger* autoloading rifles in the .22 caliber (see fig. 16.7).

The Receiver

The *receiver* of a rifle serves the same purpose as the receiver of the shotgun. It houses most of the rifle's action. The *breech block* is a part of the action that is usually covered by the receiver. The breech block is the piece of metal that fits in behind the bullet to keep it secure during firing. This device keeps the exploding gas from escaping behind the bullet and through the chamber.

This is important for two reasons. First, the gas is used to push the bullet forward and out of the barrel. Second, the breech block protects the shooter from injury. If the gas or the cartridge case ever comes out the rear of the barrel when the rifle is fired, the shooter can be seriously hurt.

Rifle Actions

The action of a rifle is the mechanism that allows the rifle to be loaded, prepares the rifle for firing, and actually fires the cartridge in the chamber. Originally, all rifles were muzzleloaders. Then new developments allowed breech-loading. Since then, a variety of rifle actions have been developed. The discussion of shotgun actions in Assignment 14 will help you to understand the actions used in rifles.

The Bolt-Action Rifle

The bolt-action rifle is considered to be the most accurate type of rifle on the market today. The main reason for this claim is the strength of its action. Once the bolt is locked into place, there is little or no chance for any movement of the lockup system when the gun is fired. This greatly improves the potential for accuracy.

Bolt-action rifles are locked at the time the bolt handle is raised up from its locked position. As the bolt is pulled back, spent cartridges are removed from the chamber and ejected

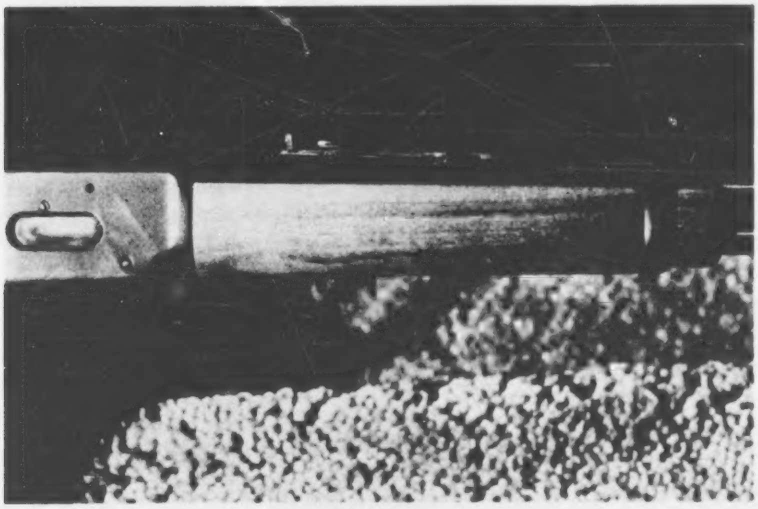


Fig. 16.6. Forearm on Two-piece Stock with Open Rear Sight. Tubular Magazine on Winchester 94 Model Rifle
(Courtesy Oshman's Sporting Goods, Austin, Texas)

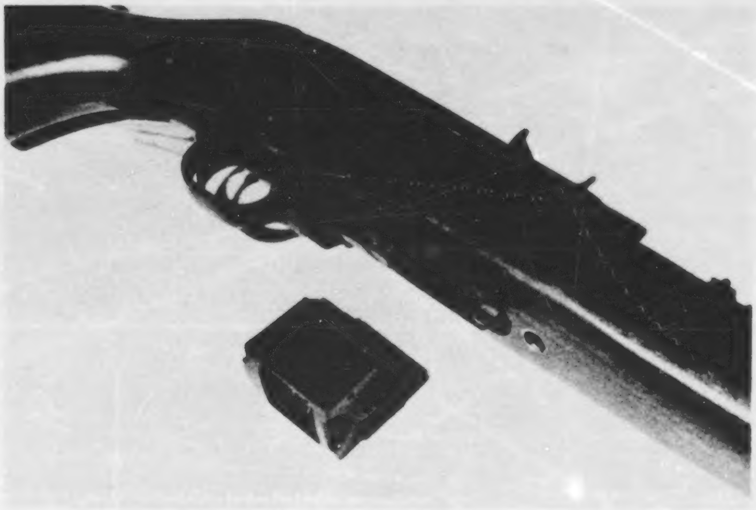


Fig. 16.7. Ruger Autoloading .22 Caliber Rifle with Rotary Magazine
(Courtesy Oshman's Sporting Goods, Austin, Texas)

from the receiver. Pulling the bolt back also allows the spring in the clip to push a new cartridge slightly upward (see fig. 16.8). When the bolt is moved forward, the new cartridge is moved into the chamber. When the handle of the bolt is pushed down, it locks into position in the frame of the receiver. At the time the handle is turned downward, locking lugs also are engaged to secure the action and provide the strong lockup previously described.

Bolt-action rifles are used for almost all rifle calibers. A large number of .22 caliber rifles employ the bolt action, as do most varmint and big game calibers. And most rifles produced for long-range varmint shooting have a bolt action, as well as the majority of the big game rifles sold in America. Other actions are also popular with shooters, but most serious shooters prefer the bolt action.

The Autoloading Rifle

The autoloading rifle provides a lot of firepower. The autoloader can be fired as quickly as the shooter can pull the trigger. Most modern autoloading actions operate satisfactorily, with little jamming.

Some people call the autoloader an automatic rifle, which is inaccurate. An automatic rifle will continue to fire as long as the trigger is depressed. Autoloading rifles must have the trigger pulled each time a shot is fired. Many people refer to the autoloader as a semiautomatic rifle, a proper description of the rifle's firing capacity.

Autoloading rifles are chambered for most cartridges up to and through the .30-06 caliber. Probably the greatest number of autoloading rifles are made to fire .22 caliber cartridges. The autoloader seems to be gaining some popularity as a deer rifle. However, it is not ever likely to challenge the popularity of the bolt-action rifle for big game hunting.

Autoloading rifles usually have tubular magazines, but some have clip magazines (see fig. 16.9).

The Pump-Action Rifle

The pump action is often used in .22 caliber rifles. It is a fast action and also offers good firepower. The pump or slide action begins to operate when the fore-end is pulled back by the shooter. This opens the action, ejects spent

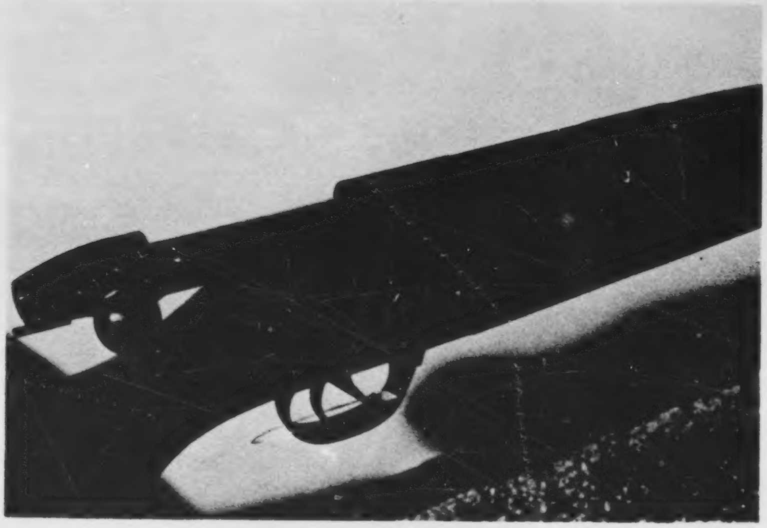


Fig. 16.8. *Bolt-action Weatherby Rifle with Action Open*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

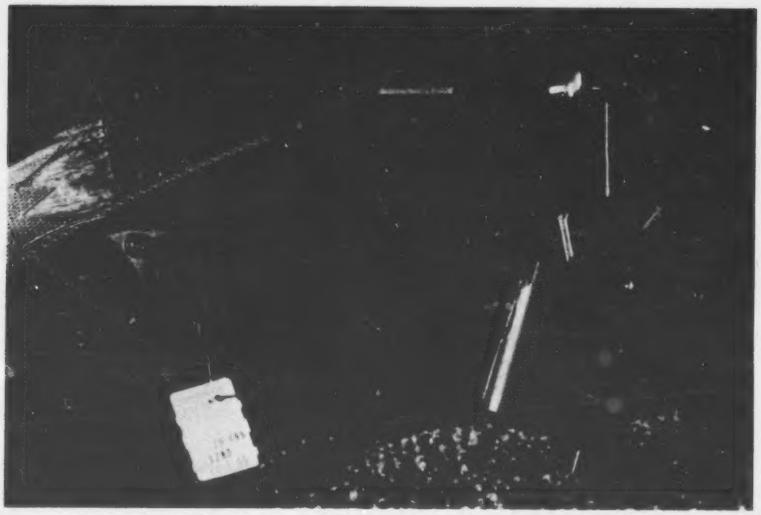


Fig. 16.9. *Autoloading Rifle with Clip Magazine, Action Open*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

shells and places a new cartridge in position to move into the chamber (see fig. 16.10). When the fore-end is pushed forward, the cartridge is placed in the chamber and the action is closed. The gun is ready to fire.

Tubular magazines are usually found in .22 caliber pump-action rifles. A tubular magazine often holds 14 .22 long rifle cartridges. This makes it possible to shoot for a while without having to stop to reload. Pump-action rifles in big game calibers usually have a clip magazine. While the .22 caliber pump-action rifles are fairly popular, pump-action rifles in big game calibers have not become widely accepted.

The Lever-Action Rifle

The lever action is one of the most popular of all rifle actions. Movies and TV westerns have helped to maintain the popularity of this rifle. Still, if the lever action were invented today and put on the market day after tomorrow, it would still be popular. This rifle is simple to operate, is durable, and has a fast action and good firepower.

As the lever is pushed down, a sliding piece of metal opens the action and cocks the hammer. It also moves a shell into position outside the chamber. As the lever is pulled up to its original position, it causes the new cartridge to be placed in the chamber and the action is closed. The gun is ready to shoot.

Most lever-action guns have a tubular magazine (see fig. 16.11), but some have clip and rotary magazines. The spent shells are ejected through holes in the receiver. Some eject the shells through the top of the receiver. When this is the case, special mounts must be used when a scope is attached to the rifle. Others eject the spent shells through a hole in the side of the receiver.

For many years, modern lever-action rifles were limited to the intermediate calibers. The .30-30 is probably the most popular cartridge for the lever action. Now, the .22 caliber lever action is a popular gun (see fig. 16.12). This action is also being used in rifles chambered for the more powerful .30 caliber cartridges and some .40 caliber cartridges.

The Break-Action Rifle

Break-action rifles allow the barrel to move down and forward, away from the stock and the firing mechanism. The cartridge is loaded directly into the barrel's chamber.

Some inexpensive .22 caliber break-action rifles have been manufactured. Some people look at these rifles and form a negative opinion about all break-action rifles. This is a mistake. Some of the best rifles employ the break action. Many of these fine rifles are manufactured in England and other European countries.

The break-action rifle has long been a favorite of those who hunt dangerous African game. These rifles are chambered for the larger .30 caliber cartridges, like the .375, as well as .40, .50 and .60 caliber cartridges. The .600 Nitro Express is one of the world's most powerful cartridges and one of the calibers offered to hunters in double-barreled break-action rifles.

For big game, the double-barreled rifle offers the hunter outstanding stopping power (will quickly drop a large animal.) Break-action rifles also provide the hunter good reloading speed. The expended shells are ejected as the action is opened. The two barrels are easily loaded and the action is quickly snapped back to a closed position. The gun is then ready to fire two more times, as quickly as the trigger can be pulled. These guns are rarely seen in gun stores in this country.

Selling Rifle Actions

The type of action that a shooter should select is the one that he or she likes and feels will provide the best service for a particular type of hunting. All actions are accurate enough to serve the needs of the average shooter. Some shooters have a natural preference for one action or another.

As a salesperson, you should help the customer find a rifle that satisfies a special set of needs and wants. If a customer wants a lever-action gun for deer hunting, do not try to sell that person a bolt-action rifle because its action is more accurate. Shooter confidence in the rifle is usually more important to accuracy than any particular rifle action.

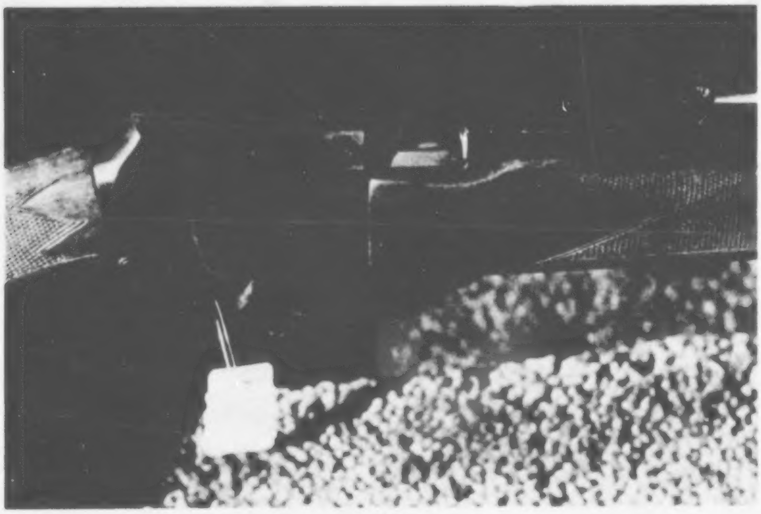


Fig. 16.10. Pump-action Rim-fire Rifle with Action Open
(Courtesy Oshman's Sporting Goods, Austin, Texas)

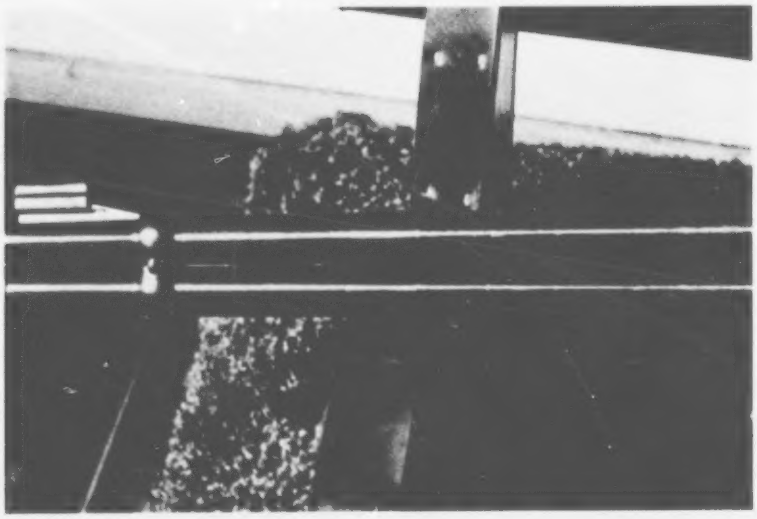


Fig. 16.11. Center-fire Lever-action Rifle (Winchester Model 94) with Tubular Magazine and Hooded Front Sight.
(Courtesy Oshman's Sporting Goods, Austin, Texas)

There may be times when you will need to give the customer some advice. If the customer plans to hunt grizzly bears with a .30-30 lever-action gun, you would want to recommend a stronger cartridge. If the customer has decided on an appropriate caliber for the game he will hunt, it is best to go along with his preference concerning the rifle's action.

The Trajectory of a Rifle Bullet

A bullet's *trajectory* is the curved line traveled by the bullet as it passes from the muzzle to its first point of contact with the ground. When a rifle is fired, the bullet starts out on the same plane as that of the bore of the gun. This means that at first the path of a bullet is the same as a line that starts at the rear of the barrel and passes through the barrel's muzzle.

As soon as the bullet leaves the barrel, it begins to be affected by gravity. This causes the path of the bullet to form an arc which finally drops to the ground. All bullets are affected by gravity in the same way. In fact, a .22 long rifle bullet and a .270 bullet, when dropped from the same height at the same time, will hit the ground at the same time. The same is true if both are fired from their respective rifles at the same time, with the muzzles at the same height and both barrels pointed at the same level, so long as the level is horizontal or upward. The difference is that the .270 bullet will be much farther out when it hits the ground. This is because it was pushed harder.

When a rifle is fired, the force of gravity immediately causes the bullet to begin dropping. If the line of your rifle's bore can be followed directly to the shoulder of the deer 300 yards away, it is possible that the bullet will drop so much that the deer will be missed completely. To hit the deer, the line of your rifle's bore must be somewhat above the deer's shoulder when you fire. If it is the right distance above the target, gravity will cause the bullet to fall the right distance to enable you to hit the deer.

Most rifles are "sighted in" so the bore axis (line of the bore) is at an angle above the line of sight. This means that the muzzle is raised slightly to give the bullet a flight that starts at a slightly upward angle. When "sighting in", the object is to aim so that the line of sight and the arced path of the bullet will intersect at the desired point.

If a .222 rifle is sighted in at 250 yards, this means that the trajectory of the bullet will cause it to cross the line of sight 250 yards from the muzzle of the rifle. If a hunter has a .270 rifle sighted in at 200 yards when using a 100-grain bullet, the sights will need a slight adjustment if a 150-grain bullet is used. This is because the 150-grain bullet weighs more and will not have the same trajectory to allow it to hit the target at 200 yards. Most telescopic sight manufacturers provide customers a chart to show how high or low a bullet will be as it passes certain points on the way to the target (see fig. 16.13).

Other factors also influence a bullet's flight. Wind and atmosphere will affect a bullet's travel. The skillful hunter learns how bullets in flight are affected by these external forces. He then learns how to aim the rifle to use these forces to guide the bullet toward, and not away from, the target.

Matching the Rifle to the Game

Rifles are very versatile firearms. A rifle chambered for the .270 cartridge can be used for many purposes. One can load it with 100-grain cartridges and use it as a varmint rifle, shooting woodchuck, coyotes, and other smaller animals The gun can be loaded with 130-grain cartridges and used for hunting deer, mountain sheep, and other medium-sized game. With 150-grain cartridges, it can be used for elk and possibly moose.

The action of a rifle is not usually selected on the basis of the game to be hunted. An exception might be in long-range varmint shooting. A bolt-action rifle might be better for this purpose. Another exception might be rifles that are chambered for very powerful cartridges and intended for use on dangerous African animals.

The major decision is in matching cartridge to game rather than rifle action to game (see fig. 16.14). This topic will be more fully discussed in Assignment 17.

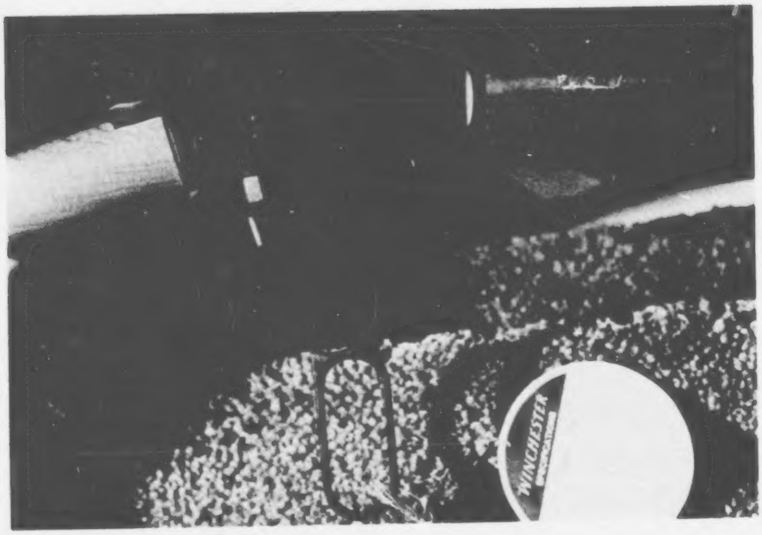

WINCHESTER

Fig. 16.12. *Lever-action Rifle with Action Open (Courtesy Oshman's Sporting Goods, Austin, Texas)*

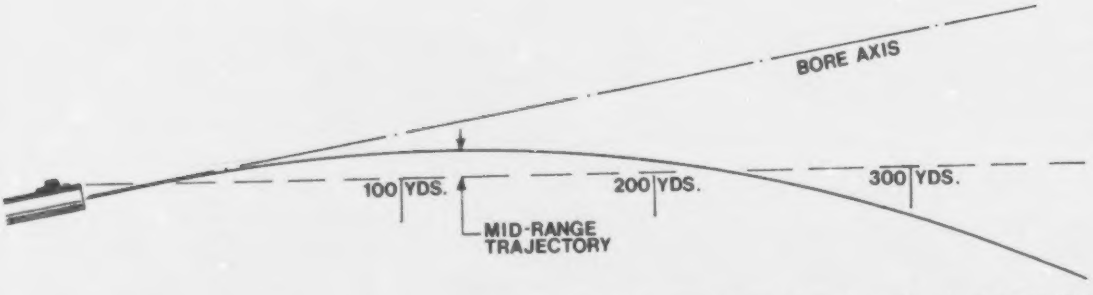

BORE AXIS
100 YDS.
200 YDS.
300 YDS.
MID-RANGE TRAJECTORY

Fig. 16.13. *Corrected Trajectory. To "correct" a bullet's curved flight, most rifles are sighted in so that the barrel tilts slightly upward. The bullet crosses the line of sight at about 25 yards and again at about 225 yards.*

(Adapted from drawing in Outdoor Life*, September, 1979)*

ENERGY TABLE

Caliber	Bullet Weight (Grains)	Muzzle Energy (Foot-pounds)	100 Yards	200 Yards
.222	50	1,094	752	500
.243	80	2,077	1,619	1,249
.25/06	100	2,316	1,858	1,478
.270	130	2,790	2,300	1,883
7 mm. Rem.	150	3,221	2,667	2,196
.30 Carbine	110	967	600	383
.30/30	150	1,902	1,296	858
.30/06	180	2,913	2,468	2,077
.45/70	405	1,590	1,227	1,001
.458 Win. Mag.	500	4,989	3,999	3,174

(Courtesy Outdoor Life, *September, 1979)*

Fig. 16.14. *Energy of Popular American Cartridges*

Questions

1. What is Webster's definition of a *rifle?*

2. What are the three major classifications of rifles?

3. What diameter must a bullet have to be used in a rifle?

4. What does the term *rate of twist* mean?

5. Which rifle on the market today is considered the most accurate?

6. Which cartridge is fired by the greatest number of autoloading rifles?

7. Name one of the most popular rifle actions.

8. When selling a customer a rifle, which action should you help the customer select?

9. What is a bullet's *trajectory?*

Projects

1. Write the Winchester-Western Company for a history of the Model 94 Winchester rifle. Use the information you receive to do a report for your class.

2. Do a report on how many rifles of each action type were sold by your store during the past six months.

3. Do a report on the various grades of walnut that are used in making gun stocks.

17

Rifle Cartridges

Objectives: *After completing this assignment, you should be able to—*

1. *give the two categories of rifle cartridges;*
2. *state the caliber of almost all rim-fire cartridges;*
3. *explain the difference between **smokeless powder** and **black powder;***
4. *explain why the .22 caliber cartridge is one of the most popular cartridges;*
5. *tell why cartridge cases are made of brass;*
6. *cite the two kinds of **primers** used in center-fire cartridges manufactured in the United States;*
7. *give the three forms in which smokeless powder is produced; and*
8. *state the purpose of the jacketing on a bullet loaded into a center-fire cartridge.*

The subject of rifle ammunition is more complex than that of shotgun ammunition. Shotguns are chambered for one of six gauges. Some have 3-inch chambers to accommodate magnum loads. In all shotshells, however, the diameter of the hull or case is the same, within any one gauge.

A rifle may be chambered for one of 30 or more U.S. cartridges. Many of these cartridges fire bullets of the same size. The cartridges are not interchangeable since the size of cartridge cases differ. This is because each cartridge has its own powder load which changes from one cartridge to the next. A .243 and a 6 mm cartridge contain bullets of the same size, but the 6 mm cartridge case is longer and will not fit into a rifle chambered for the .243 cartridge.

Rifle cartridges can be divided into two major categories. These are rim-fire and center-fire cartridges.

Rim-fire Cartridges

Almost all rim-fire cartridges are .22 caliber. The main exception is the 5 mm rim-fire cartridge. The components of a rim-fire cartridge are much the same as those of a center-fire cartridge. The main difference is the *primer* (see fig. 17.1). The center-fire cartridge has a primer set into the center of the base of the cartridge, whereas the primer of a rim-fire cartridge is located in the rim of the cartridge. The primer is actually a compound that is placed in a trough inside the rim.

The firing pin of a .22 rifle is designed to hit the rim of the cartridge. This causes the priming mixture to ignite and this, in turn, causes the smokeless powder in the cartridge case to begin to burn. The gas from the burning powder pushes the bullet through the barrel and toward the target. Most .22 cartridges now use a noncorrosive priming compound.

The Case

The case of a .22 rim-fire cartridge is made of brass. It is a straight case with no shoulder or neck. The case has the same diameter as the bullet but its length varies. For many years, different sizes of .22 cartridges were made to fit short, medium, or long rifles. Each cartridge had a different length case. Most earlier and modern rifles will shoot all three sizes.

Now, customers buying .22 rifles have a choice of a .22 magnum cartridge. This is still a rim-fire cartridge, but it has a longer case and is a "hotter" load. A rifle must be specially chambered for this cartridge.

The Bullet

Most .22 rim-fire cartridges are of solid lead, with two exceptions. One is the hollow-point bullet which has a hole in its nose. This bullet flattens on impact. The other exception is the .22 caliber shot cartridge which contains no. 12 shot. A .22 short bullet weighs 29 grains; the .22 long bullet also weighs 29 grains, but the .22 long rifle bullet weighs 40 grains. A .22 long rifle hollow-point bullet weighs 38 grains, and the .22 magnum bullets are also 40 grains in weight. The Remington 5 mm magnum fires a bullet weighing 38 grains.

Some "hotter" .22 long rifle cartridges are now produced. They can be fired in a standard .22 caliber rifle. The bullets in these cartridges usually weigh 33 grains. Some .22 bullets are copper-plated.

The Powder

Smokeless powder is used in a .22 caliber cartridge. In figure 17.1, you will notice the cartridge is loaded with powder produced in the form of flakes. Smokeless powder does not actually explode, like gunpowder. It burns rapidly, producing the gas which pushes the bullet down the barrel.

The .22 caliber cartridge is one of the most popular of all cartridges. It is inexpensive to shoot, creates little noise, and has no recoil. Also, this cartridge is extremely accurate. All of these features combine to guarantee that the .22 caliber cartridge will be popular for a long time.

Center-fire Cartridges

Center-fire cartridges are used for more powerful loads and bigger bullets (see fig. 17.2). Bullets fired from a center-fire cartridge have a much greater velocity than a .22 bullet. They strike the target with more energy and have greater penetration power. A center-fire cartridge consists of four basic components—the cartridge *case*, the *primer*, the *powder*, and the *bullet*.

The Cartridge Case

The case is the main part of the cartridge which holds the cartridge components. After a rifle is

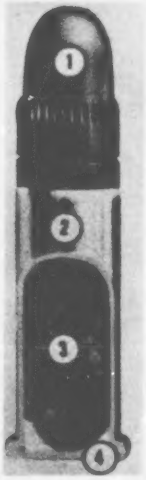


Fig. 17.1. *Parts of a .22 Caliber Rim-fire Cartridge (Courtesy Federal Cartridge Corporation)*
1. The Bullet 2. The Cartridge Case
3. The Powder 4. The Primer

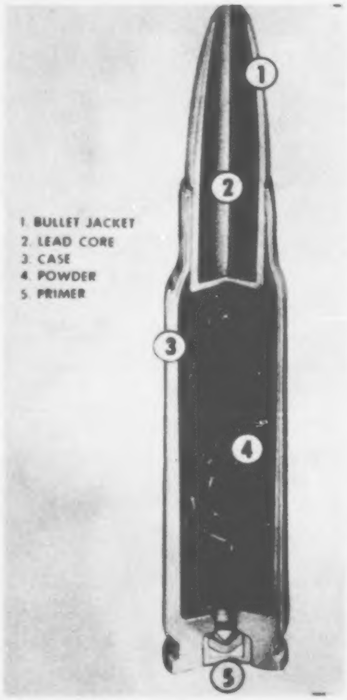


Fig. 17.2. *Parts of a Center-fire Cartridge (Courtesy Federal Cartridge Corporation)*

fired, the cartridge case is the part that remains. It is the only part of the cartridge that is reusable (see fig. 17.3).

The case is made of brass, which can expand slightly without breaking. When the cartridge is fired, the case, especially the neck (in a center-fire cartridge), expands against the walls of the chamber. This seals the chamber and prevents gas from escaping behind the cartridge.

As long as the chamber is the correct size, this all works satisfactorily. If the space allowed between the walls of the chamber and the cartridge is too great, the case will shatter when the gun is fired. The space between the walls of the chamber and the cartridge case is called *head space.*

The Rim. The rim is the rearmost part of the cartridge. It is a part of the base or the head of the cartridge case. There are five rim types, but three of these are used more than the other two. *The rimmed cartridge case* has a rim with a greater diameter than the body of the case. A *rimless case* has a rim of lesser diameter than the body of the case. A *belted rim* is reinforced. Most magnum cartridges have a belted rim (see fig. 17.4).

The piece of the cartridge that forms the rim has a hole in its center. The primer fits tightly into this hole and is held in place by friction.

The Shoulder and Neck. A center-fire cartridge case is usually larger than the bullet it contains. For the bullet to fit into the case, the case must be narrowed down or "necked" down to the same diameter as the bullet. This narrowing begins at the shoulder of the case. The bullet fits into the neck, the longer part that is the same diameter as the bullet.

When the gun is fired, the walls of the neck expand slightly to press tightly against the walls of the chamber. This will result in a slight increase in the diameter of the neck. The neck may also become slightly longer after the case is used a few times. This is why, when reloading the cartridge case, the neck is usually resized and sometimes trimmed.

The Primer

The primer, located in the center of the cartridge base, explodes when struck by the gun's firing pin. When the primer explodes, it sends a flash of fire through the flash hole into that part of the cartridge case where the powder is stored. This causes the smokeless powder to burn.

Two sizes of primers are used in the United States. One is the small rifle size, .175 inch in diameter. This primer is used in smaller cartridges like the .222 Remington. The other primer is the large rifle size, .210 inch in diameter. It is used in all the larger rifle cartridges.

American cartridges use a type of primer invented by Edward Boxer, a British officer. This primer consists of a *cup, anvil,* and the *primer mix.* The gun's firing pin hits the surface of the cup. When this happens, the cup's surface is dented inward and strikes the anvil.

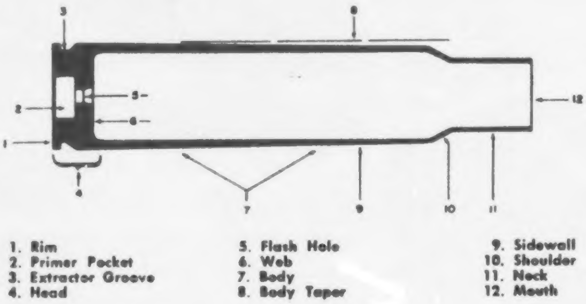


Fig. 17.3. The Parts of a Cartridge Case (Courtesy Speer, Incorporated)

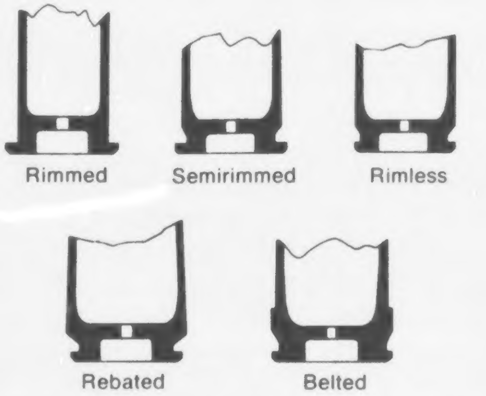


Fig. 17.4. Rim Styles of Center-fire Cartridge Cases (Courtesy Speer, Incorporated)

The concussion causes th[illegible] mix to explode, and the powder in the ca[illegible]s ignited.

Most primers used in modern ammunition are noncorrosive. A gun's barrel should be cleaned after a day in the field. Until noncorrosive primers were used, the gun had to be cleaned immediately upon the hunter's return from the field. This was necessary since primer material left in the barrel would attract moisture and cause the barrel to rust.

The Powder

Gunpowder is believed to have first been used by the Chinese. In the 1200s Roger Bacon fully classified the uses of gunpowder and developed a formula for gunpowder and its uses. By the late 1800s, smokeless powder had been developed.

Smokeless powder does not explode or burn all at once. It burns progressively. It is true that this happens very fast. The point is that *smokeless powder* and *black powder* react differently when exposed to spark or flame. Black powder is fairly unstable. It is not safe to store it in large quantities. Smokeless powder is difficult to ignite in any way other than exposing it to a spark or a flame. It is not as dangerous to handle or store as is black powder.

Smokeless powder is produced in three forms—*flake, ball,* and *tubular.* Cartridges are loaded with the type of powder that best serves the purpose of the cartridge. The powder may be controlled to burn slowly, at a moderate speed, or very rapidly. Even the slow-burning powder finishes burning in an instant. A slow-burning powder in a rifle with a barrel of the right length can be used to propel a bullet from the barrel at a very high speed.

The Bullet

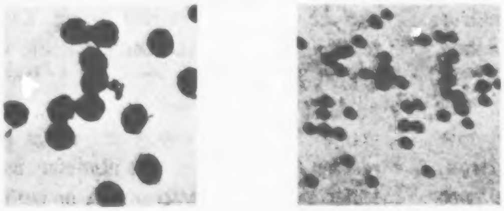
All commercially produced center-fire cartridges in the United States have *jacketed bullets.* A jacketed bullet is a lead bullet coated with some harder type of metal. The jacket may be made of brass, steel, copper, or a copper alloy. The jacket helps the bullet retain its shape when it is fired. It also helps the bullet penetrate the target.

The jacketing of the bullet determines how the bullet will perform when it hits the target. Full-jacketed bullets are used for dangerous game. This is so that the bullet will penetrate hide, muscle, and bone until it hits a vital area such as the brain or the heart and lung area.

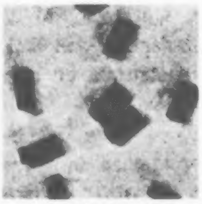
Some bullets are not jacketed at the nose, so that the bullet will begin to mushroom on impact. The jacket still helps the bullet to penetrate to a vital area. Other bullets have jackets that are designed to peel back to allow fairly rapid expansion of the lead bullet.

The shape of the bullet is also important (see fig. 17.6). The nose of a bullet may be almost flat, rounded, semipointed or sharply pointed. It may also have a hollow point. Sharply pointed bullets are often used in guns for long-range shooting. The pointed bullet does not slow down as quickly as a rounded or flat-nosed bullet. Sharp-pointed bullets are usually used in high-velocity loads. Flatter-pointed bullets may be used in "slower" loads. They travel at slower speeds but have a lot of "punch" when they hit the target. Flat-nosed bullets usually expand rapidly once they hit the target.

The name of a cartridge is sometimes confusing. Part of this confusion comes from the



(1) FLAKE (2) BALL



(3) TUBULAR

Fig. 17.5. Three Common Types of Smokeless Powder (Courtesy Speer, Incorporated)

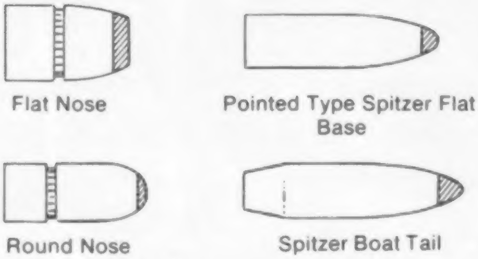


Fig. 17.6. *Bullet Types. Almost all modern rifle bullets consist of a soft lead core inside a copper-alloy jacket. (Adapted from drawing in* Outdoor Life, *September, 1979, from "The Hunting Rifle," by Jim Carmichel.)*

fact that the bullet is bigger than the original bore of the rifle. Remember that a .30 caliber barrel starts out with a hole .30 of an inch drilled through the center. Then, the bore is rifled about .004 inch deep on each of the sides of the barrel. The bullet must have a diameter as large as the *grooved*, or rifled, barrel. This means that a bullet for a .30-inch bore would have to be .308 inch in diameter.

Some calibers are named according to the *original* diameter of the bore, before it was rifled. This means that a .30 caliber gun shoots a bullet that is really .308 inch in diameter. Other calibers are properly named by referring to the actual diameter of the bullet. One such caliber is the .308 caliber. Actually, a bullet fired in a .30 caliber rifle has *exactly* the same diameter as a bullet fired in a .308 rifle.

To confuse things even more, some calibers are named after the gun that was developed to shoot a particular cartridge. A classic example is the .30-06 cartridge. This cartridge was developed for military use in 1906. It was a .30 caliber cartridge. The government, to avoid its being confused with other .30 caliber cartridges, called it the .30-06. (This means it is a .30 caliber cartridge that was developed for military use in 1906.) The .30-06 cartridge is loaded with a bullet that is .308 inch in diameter. Bullets of .308 diameter are also used in .30/30 and .200 H&H Magnum rifles.

The best thing to do is to keep a chart handy until you can learn the diameters of the various calibers. Above all, do not make the mistake of assuming that the name of the cartridge automatically tells you the diameter of the bullet it contains. After what you have just read, you might guess that a .303 British cartridge contains a bullet .308 inch in diameter. Actually the bullet is .311. That extra .003 of an inch could ruin a fine .30-06 rifle and badly injure a shooter who tired to fire it in a rifle chambered for the .30-06. Study figure 17.7 for information concerning the bullet diameter of most of the cartridges you will have an opportunity to sell.

Matching the Cartridge to the Game

In Assignment 16, we mentioned that a single rifle can often be used for hunting more than one type of game animal. In fact, some rifles can be used for animals ranging from varmints to big game. The important thing to remember is that the hunter can do this only by changing the load. A .270 rifle loaded with a cartridge containing a 100-grain bullet is fine for hunting coyote. The 100-grain bullet needs to be replaced by a 130-grain bullet if that .270 rifle is to be used to hunt most deer. If the hunter intends to use the rifle to hunt moose, it should be loaded with cartridges having 150-grain bullets.

Several calibers are very versatile, and one relatively new development can possibly make rifles even more so. One ammunition manufacturer has produced a device, called a *sabot*, which can enable a large-caliber rifle to fire a .22 caliber bullet. Remington introduced a .30-06 cartridge that was loaded with a sabot containing a 55-grain .22 caliber bullet. The bullet used is the same used in .22/250, .223, and .222 magnum loads. The sabot is made of plastic. When the gun is fired, the rifling causes the sabot to spin, just like a bullet. The sabot and the bullet leave the barrel spinning at just over 4,000 feet per second. This is a very fast load. The sabot falls away from the bullet immediately after it leaves the barrel, and the bullet then continues to the target.

As a firearms salesperson, you should be able to recommend the proper loads to your customers. You will want to study literature provided by the various ammunition manufacturers which contains the recommendations concerning the cartridges to use for various game.

Questions

1. What are the two categories of rifle cartridges?
2. What is the caliber of almost all rim-fire cartridges?
3. Does smokeless powder explode, like black powder?
4. Why is the .22 caliber cartridge one of the most popular of all cartridges?
5. Why is brass used to make cartridge cases?
6. What are the two sizes of primers used in center-fire cartridges manufactured in the United States?
7. In what three forms is smokeless powder produced?
8. What is the purpose of the *jacketing* on a center-fire bullet?

U.S. Name	Bullet Diameter (Inches)	Metric Name
.22 Hornet	.223-.224	5.6 × 35R
.222 Remington	.224	5.7 × 43
.223 Remington	.224	5.7 × 44
6 mm. Remington	.243	6.57
.243 Winchester	.243	6.51
.250 Savage	.257	6.3 × 48
.257 Roberts	.257	6.3 × 57
.25/06 Remington	.257	6.3 × 63
.264 Winchester Magnum	.264	6.5 × 63
.270 Winchester	.277	6.9 × 64
.280 Rem. (7mm Rem. Express)	.284	7.63
7 mm. Mauser	.284	7.57
7 mm. Remington Magnum	.284	7 × 63 Rem. Mag.
.30/30 (.30 WCF)	.308	7.62 × 51R
.30/40 Krag	.308	7.62 × 59
.300 Savage	.308	7.62 × 47
.308 Winchester	.308	7.62 × 51
.30/06	.308	7.62 × 63
.300 H&H Magnum	.308	7.62 × 72
.300 Winchester Magnum	.308	7.62 × 66 Win. Mag.
.303 British	.311	7.7 × 56R
8 mm. Mauser	.319-.323	7.9 × 57
.32 Winchester Special	.321	8 × 51R
.338 Winchester Magnum	.338	8.58 × 63 Win. Mag.
.35 Remington	.358	9 × 49
.375 H&H Magnum	.375	9.5 × 72
.44 Magnum	.429	10.9 × 32
.45/70	.458	11.5 × 53
.458 Winchester Magnum	.458	11.5 × 63

(Courtesy Outdoor Life, *September, 1979, from "The Hunting Rifle," by Jim Carmichel.)*

Fig. 17.7. *U.S. and Metric Cartridge Designations*

Projects

1. Study literature from the various ammunition manufacturers and determine how many sizes of bullets are used in cartridges made in the United States. List the cartridges that use each bullet size.

2. Do a study of your store's records and analyze the sales of rim-fire cartridges. Try to determine the percentage of sales accounted for by each of the following: .22 short, .22 long, .22 long rifle, and .22 magnum.

3. If possible, watch someone reload center-fire rifle cartridges. Write a brief report on the order in which the components were used during the reloading process.

18

Telescopic Sights

Objectives: *After completing this assignment, you should be able to—*

1. *name the advantages gained by using a telescopic sight;*
2. *cite the two groups into which scopes are divided;*
3. *state the magnification that those hunting in heavily wooded areas need to use;*
4. *define the "field of view" of a scope;*
5. *tell what the term "eye relief" means;*
6. *tell how a coated lens improves the image seen through a scope;*
7. *define the reticle of a scope and cite the most precise of all reticles;*
8. *explain how a* ***collimator*** *is used; and*
9. *tell why a good rifle scope is filled with nitrogen gas.*

Most rifles come from the factory with open sights so that the rifle can be used immediately. Some rifles come from the factory with no sights at all. This is often the case with rifles used in varmint hunting. Factory personnel know that the customer will probably install a telescopic sight and often prefers not to have open sights on the rifle.

A moderate number of shooters choose not to install telescopic sight on their rifles. The majority of people who buy center-fire rifles, however, will install a telescopic sight.

Telescopic sights are called *scopes* by most shooters. You will often be asked to recommend a scope to a customer who has just purchased a rifle. For that reason, you should be knowledgeable about telescopic sights in general and, specifically, about those handled by your store.

Advantages of the Telescopic Sight

There are several advantages to installing a telescopic sight on a rifle. You will want to remember to mention these to the customer as you show and demonstrate the scopes.

It Is Easier to See the Target

One of the most obvious advantages of a scope is that it magnifies the target. With a four-power (4X) scope, the object seems to be four times closer than it really is. This helps the shooter see all of the target that is exposed to the shooter, not just what the naked eye can see. The shooter has an opportunity to look at the target without straining his or her eyes.

It Is Easier to Identify the Target

If you have ever hunted deer at dawn or dusk, it is likely that you have seen deer that you could not positively identify. If a deer is at much of a distance from the hunter when the lighting is not good, the naked eye often cannot distinguish a buck from a doe. If a deer is in a heavily shaded area on a bright day, it is sometimes hard to see or identify.

A rifle fitted with a telescopic sight takes much of the guesswork out of hunting. Most of the time, your scope will be a great help in identifying what a distant object really is. To the naked eye, a shadow on a stump can often resemble a deer, rabbit, or some other game.

The ability to identify your target positively makes you a safer hunter. A hunter should never pull the trigger until he or she is sure the target is really a legal one. A scope can help ensure that you are firing at a game animal and not a fellow hunter who is on all fours looking for a lost contact lens.

Aiming Is Quicker

The moment you see a target through the scope, your aiming problems are almost over. Then, all that's necessary is to move the reticles (the dot or cross hairs) so they rest on the exact spot you want the bullet to hit. This is much quicker than finding the target and then lining up the front and rear sights so the rifle is properly aimed.

One point a beginning shooter must remember is to be sure to place the cross hairs at the desired point of impact. Just seeing a target through the scope does not mean that the rifle is properly aimed.

Aiming Is Easier

It is difficult to focus on three objects that are not the same distance from the eye. In fact, it's almost impossible to do so. A hunter using open or peep sights must look closely enough at the front and rear sights to line them up correctly. At the same time, the target must also be kept in view. A telescopic sight makes the target and the cross hairs appear to be the same distance from the shooter. This makes it much easier to aim the rifle. This is especially true if the target begins to move quickly.

Aiming Is More Precise

When aiming at a bull's-eye 200 yards away, while using open sights, you may not be able to see all of it. In fact, you may not be able to see a good part of the target. Your front sight may appear to cover much more than the bull's-eye.

This might be all right if your target is a large animal. If the target is a small animal, the bullet may not be placed accurately enough to ensure a clean kill.

When using a scope, the target is magnified. The cross hairs do not usually "block out" much of the target. This makes it possible for you to clearly see the target. The cross hairs of the scope can be placed exactly upon the spot you want your bullet to hit. If the rifle is sighted in and you did not flinch or make some other mistake, your bullet should hit exactly where you aimed. This precision in aiming is not usually possible with open or peep sights.

Precise shooting is important. A sport hunter likes to make a clean and quick kill. This avoids having to trail wounded animals. It also prevents the waste of animals that escape only to die later from their wounds. Another reason for precision shooting is to keep from destroying meat that might otherwise be eaten. A bullet that hits a deer in the chest or neck will not ruin much meat. A bullet through the hams will ruin much of the edible meat of the deer.

The scope will not guarantee that every animal will be taken with one shot. It does improve the chances that game will be killed, not wounded, and the the animal will yield more edible meat.

Explaining the Telescopic Sight to Customers

Many of your customers will know quite a bit about scopes. Others will be familiar with some terminology but not much else. Others will know nothing at all. In all cases, you should be knowledgeable about scopes. A scope is usually a big investment. A good scope may easily cost half or three-fourths as much as a good rifle. When a customer is spending this kind of money, he expects the salesperson to give him good information.

The Size of the Tube

Scopes may be divided into two groups. One group includes scopes made for use with .22 rim-fire rifles. The other group includes scopes made for use with center-fire rifles (see fig. 18.1).

There are a great many differences between scopes in these groups. One of the most obvious differences is the diameter of the tube of the scope. Most scopes made for .22 rim-fire rifles are less than one inch in diameter. Most of these tubes have a diameter of about .875 inch. Scopes used on center-fire rifles are usually one inch in diameter. The scopes with higher magnification and variable magnification are usually longer than scopes of up to four power (4X) in magnification.

Scopes made for use with rim-fire rifles do not have to withstand the recoil that other scopes must withstand. For that reason, they are less espensive to manufacture. However, the image in these scopes is not usually as bright or as clear as that of scopes with one-inch tubes. Most of the shooting done with a .22 rim-fire rifle does not require a scope.

If one seriously needs a scope on a .22 rim-fire rifle, the extra cost of a center-fire scope may be justified. Special mounts enable these scopes to be installed on .22 rifles with grooved receivers. The mounts for almost all .22 rifle scopes are designed to fit the grooved receivers on most .22 rim-fire rifles (see fig. 18.2).

Magnification

Most, but not all, scopes *magnify the target.* This means that the target looks closer than it does with the naked eye. A scope with a 4X magnification can make a deer that is 400 yards away from the shooter look like it is only 100 yards away. This helps in identifying the target and in aiming at the precise spot you want to hit.

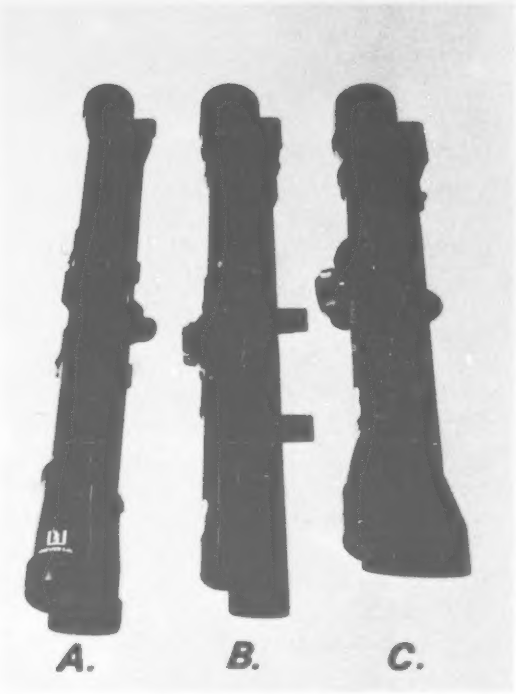


Fig. 18.1. Rim-fire and Center-fire Scopes (Courtesy Oshman's Sporting Goods, Austin, Texas)
A. ¾" Rim-fire Scope B. ⅞" Rim-fire Scope
C. 1" Center-fire Scope

A hunter looking for deer in a heavily wooded area will probably need a scope with lower magnification. A two-power scope (2X) might be just right. This scope enables the shooter to quickly find a deer in the scope. Since most shooting is at fairly close range, a high-magnification scope is not needed. The "field of view" is also wider for scopes with lower magnification.

Field of View. One point to remember is that the higher the magnification, the narrower the field of view. The *field of view* refers to the width of the scene one can see through the scope. The specifications from one manufacturer indicate that with a 2½X scope, the shooter has a field of view that is 40 feet wide when aimed at an object 100 yards away. This can be critical when trying to hit a fast-moving target. If the field of view is very narrow, it is difficult to even locate a target through the scope.

This is very important information and should be explained to someone who is not knowledgeable about scopes. Some scopes are designed as wide-angle scopes and provide a wider field of view than regular scopes.

Variable Magnification. Some scopes enable a shooter to dial a desired magnification. This means that a scope may be set at a low magnification for hunting moose in heavy brush and set at a high magnification when hunting coyotes in open country. These scopes can enable a hunter to get the greatest possible use out of a rifle.

A common magnification range is from 3-9X. Several other magnification ranges are built into variable-power scopes (see fig. 18.3). These scopes are usually heavier and more costly than fixed-power scopes.

Eye Relief

Eye relief refers to the distance that the shooter's eye must be from the eyepiece in order to see a good image through the scope. If the eye is not at the right distance, only a part of the eyepiece will be "filled" with a picture.

This is an especially important consideration

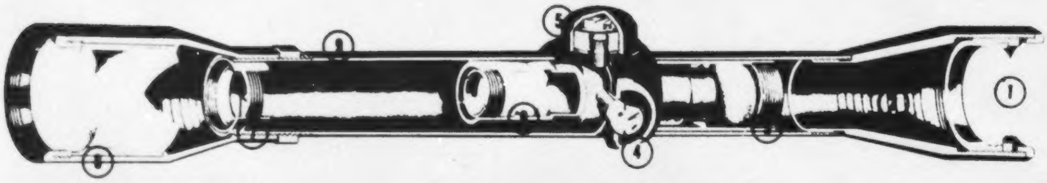


Fig. 18.2. Cutaway view of a telescopic sight reveals (1) eyepiece lens; (2) antireflection serrations; (3) eyepiece lock ring; (4) windage adjustment knob; (5) elevation (range) adjustment knob; (6) double erector lens; (7) reticle; (8) double objective lens (exit pupil); and (9) steel housing.
(Courtesy Savage Arms)

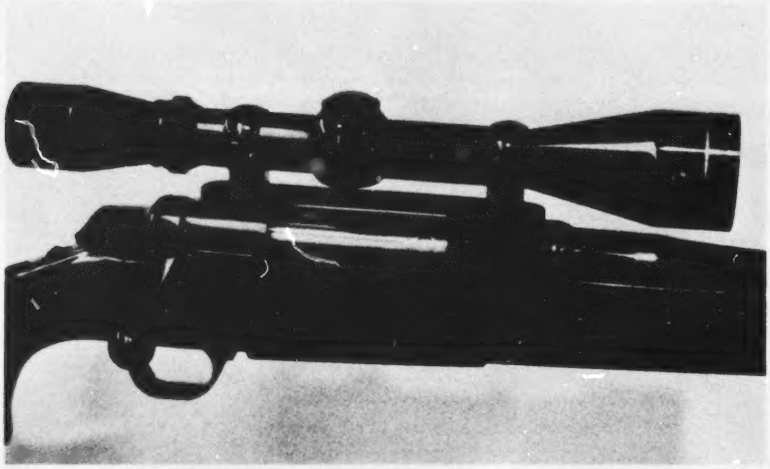


Fig. 18.3. Variable Magnification Scope on Bolt-action Center-fire Rifle
(Courtesy Oshman's Sporting Goods, Austin, Texas)

when shooting rifles with a lot of recoil. If the eye relief distance is too short, the recoil of the rifle will cause the scope to hit the shooter—usually at about the eyebrow. This can easily cause a cut severe enough to require stitches for closing the wound.

The eye relief distance should be at least three inches. A longer eye relief would be advisable in scopes mounted on guns chambered for magnum cartridges. Some rifles, like the Winchester Model 94 Lever Action .30/30, will not accommodate scopes that are mounted over the action. Some manufacturers produce scopes with a long eye relief for use with these rifles. A scope for this type of rifle might have an eye relief distance of eight inches.

The Quality of the Image

A good scope will provide a sharp, bright image. A sharp image will be clear, with no hazy spots. A scope of inferior quality may have an image that is clear at the center, but not so sharp at the edges. The brightness of a scope is determined by how well the scope utilizes the available light. The image should be "well-lighted." Even in the poor lighting at dusk or dawn, a good scope will "gather" light and make the image brighter or better-lighted than that seen by the naked eye.

One feature that will greatly improve the image of a scope is the *coated lens*. If the lenses of a scope are coated, the brightness of the image is usually better than with uncoated lenses.

The Reticle

How do you aim with a scope? When you look through the scope at a target, you will see something "extra," called a *reticle*. The reticle is the device that enables the rifle to be aimed at a target. Different rifles use various reticles.

Some use the cross-hair reticle, the most precise of all reticles. It has two lines, in the form of a cross. The rifle bullet is supposed to hit the spot where the two lines intersect. Some cross hairs have a dot at the point where the two lines intersect. Other scopes have a post and a cross hair. The post is a heavy line that extends from the center to the bottom of the scope. A horizontal line or cross hair extends across the scope. The point where the post and cross hair intersect should be placed on the target. The dot and post are obvious enough to be seen even when the lighting is not good. It is possible that a hunter would not be able to see the cross hairs in poor light.

A variation of the post is a reticle that begins as a post at the top, bottom, and each side of the scope. As the four posts near the center of the scope, they narrow down to cross hairs. This gives the shooter the advantage of good visibility plus the precision of the cross hair. This type of reticle is called the "Dual X."

Other scopes have range-finder reticles which are used to closely estimate the distance to the target. This type of reticle consists of two horizontal lines, and the target is positioned between these two lines. The shooter then elevates the rifle to accommodate for the drop of the bullet at the indicated range. Some scopes allow the shooter to dial the distance on the scope and then place the reticle on the target, as if the target were much closer (see fig. 18.4).

Sighting in the Scope

The reticles of a scope can be moved to adjust the line of sight so the bullet will hit at a desired point. When a scope is installed on the rifle at a store, the salesperson or technician will usually use a device called a *collimator* (see fig. 18.5) to align the scope with the bore of the rifle. Only minor adjustments are then needed for pinpoint accuracy with the scope.

The reticles are moved by turning two knobs found on the scope. One knob controls the horizontal cross hair and the other controls the vertical cross hair. The knobs usually click as they turn. Each click will move the point of impact a specified fraction of an inch. The salesperson should explain this to the customer.

Is It Fogproof?

A good rifle scope is filled with nitrogen gas and tightly sealed. The nitrogen gas keeps the scope from fogging up inside. If outside air is allowed into the scope, moisture in the air will condense at some time. The image in the scope will then be hazy or cloudy.

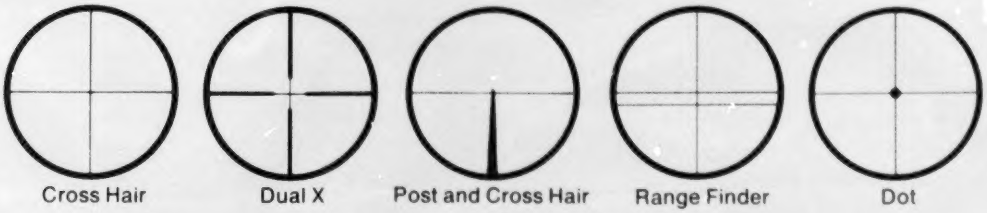


Fig. 18.4. *Reticles (Courtesy Weaver Catalogue)*

Mounts for the Scope

Buying a scope and not buying the mounts is like buying paint and not buying a paintbrush. A scope is attached to the rifle by the use of a *mount* and *rings*. The gun's receiver is usually tapped, so it is not necessary to drill holes. The mount must be attached to the receiver with screws. The rings are attached to the scope and then to the mount. Most customers highly prefer that this be done when the rifle is purchased. As a gun salesperson, you will probably need to learn to install telescopic sights on rifles.

The telescopic rifle sight is a great aid to the shooter. Every customer is a prospect for a rifle scope. The scope, mount, and rings are natural "plus selling" items that should always be suggested to the customer.

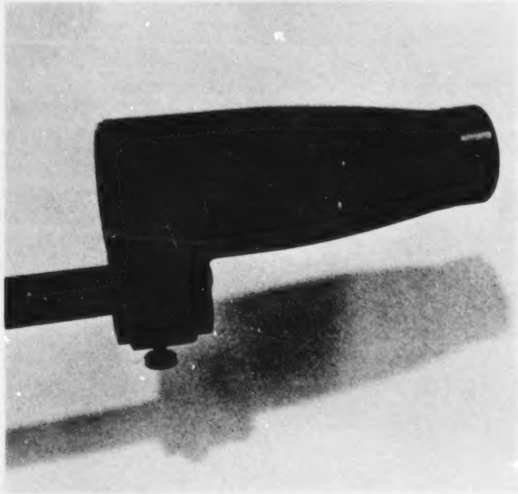


Fig. 18.5. *Collimator*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

Questions

1. List the five advantages of using a telescopic sight.
2. Into what two groups are scopes divided? What is the size of the tube for each group of scopes?
3. Would a hunter who hunts in heavily wooded areas more likely need a scope with high or low magnification?
4. What is a scope's *field of view?*
5. What does the term *eye relief* mean?
6. How does a *coated lens* improve the image seen in a scope?
7. What is a *reticle,* and what is the most precise form of reticle?
8. What is the purpose of a *collimator?*
9. Why is a good rifle scope filled with nitrogen gas?

Projects

1. Look through scopes with various types of reticles. Decide which two types you like best, and write down your reasons for selecting them.

2. Do a survey of customers, asking which type of reticles they prefer and why. Keep a list of the answers and write this in the form of a report. Keep this and remember to use some of the better reasons as selling points when demonstrating a scope.

3. Do a feature-benefit analysis sheet for a scope designed for .22 rim-fire rifles, a scope with a fixed magnification, a scope with variable magnification, and a scope with a range-finder device.

19

Handguns

Objectives: *After completing this assignment, you should be able to—*

1. *give four main reasons people buy pistols;*
2. *cite the smallest pistol caliber allowed for big game hunting in most states;*
3. *list the three basic types of modern handguns;*
4. *give the standard and optional barrel lengths for a revolver;*
5. *tell why many revolvers are called "six shooters";*
6. *state how target hammers and target triggers are different from normal hammers and triggers;*
7. *name the two revolver actions;*
8. *give the type and location of the magazine in autoloading pistols;*
9. *describe how the velocity of a pistol bullet compares with that of a rifle bullet; and*
10. *tell how to find the correct cartridge to use in a particular pistol.*

As a sporting goods salesperson, you may have an opportunity to sell handguns. Since special licenses are required, some sporting goods stores do not handle handguns. Since many stores do handle these guns, it is likely that you will need to know about this type of firearm sometime during your career.

Most people refer to handguns as pistols. In this assignment, we will often use the word *pistol* instead of handgun.

Uses of Handguns

A pistol is like a rifle in some ways. It has a rifled barrel and shoots a single projectile called a bullet. In fact, some pistols and rifles are chambered for the same cartridges. While similar in some ways, the pistol differs from a rifle in other ways. The length of a pistol's barrel causes the pistol to perform differently from a rifle.

Rifles are generally superior to pistols in long-range accuracy, effective killing range, and muzzle velocity of the bullet. The pistol is somewhat limited in these areas. These limitations affect the uses of the pistol. The four main reasons why people buy pistols are for *home protection, collecting, hunting,* and *target shooting.*

Home Protection

This buying motive will not be discussed at length in this assignment, but the salesperson should recognize that it exists. Any person who buys a firearm for home protection should be thoroughly familiar with the gun and with gun safety. In general, a person who is not skilled in the use of a rifle or a pistol should not depend on one for protection.

Collecting

Pistols are often bought by collectors. In fact, this market is large enough so that manufacturers may make certain pistols for that purpose alone. Collectors may specialize in old guns, new guns, or other specific types of guns. Information about gun collecting is available in many books written for collectors.

Hunting

Pistols have been used in hunting for many years. This is especially true of varmint hunters who have learned to call coyotes, bobcats, and other varmints. These animals often come within effective pistol range when responding to a call.

In more recent years, some hunters have started to hunt deer with pistols. This type of hunting is gaining popularity. Some states are considering establishing special seasons during which only pistols could be used to hunt deer. This would be similar to current bow hunting or muzzle-loading seasons which usually last for a week or two. They are often scheduled prior to the regular deer-hunting season.

Some problems arise when a hunter uses a pistol to hunt animals as large or larger than deer. A hunter must remember that a pistol is not as effective as a rifle in hunting deer.

One problem is the pistol's killing power. The .357 Magnum is the smallest caliber allowed for big game hunting in most states. This is a powerful pistol, much more powerful than nonmagnum pistol loads. Even then, the .357 Magnum has only the killing power of a .22 Hornet rifle cartridge. The .22 Hornet is illegal for deer hunting in most states.

According to Ed Zern of *Outdoor Life Magazine*, a .44 Magnum has less killing power than a .30/30 Winchester rifle cartridge. This is not to say that the .357, .41, and .44 Magnum pistols will not kill big game. They have already been used in killing some big game animals. The point is that the hunter must be skillful in using the pistol. It must not be expected to perform like a rifle.

The accuracy of a pistol is another problem when it is used for hunting purposes. Since the pistol has a short barrel, the sighting line is not as long as that of a rifle. This makes it easier to miss a target that is a good distance away.

While pistols have not been as widely proven as big game guns, they are adequate for some big game as well as smaller game. The provide a challenging alternative to the rifle when hunting varmints, small game, and deer.

Target Shooting

Target shooting is popular and can take many forms. Target shooting includes everything from tin can plinking to serious competition in shooting matches. Almost any caliber pistol can be used in target shooting. The .22 rim-fire pistol is popular and inexpensive to shoot. People who do a lot of center-fire pistol shooting often reload their own cartridges.

Serious match shooting includes competition in shooting with .22 rim-fire pistols as well as with the larger center-fire pistols. However, persons seriously in competition can be very selective in what they buy, and only a few models of pistols may meet their needs. Often local shooters' clubs have information on pistols used.

Types of Handguns

Three basic types of modern handguns are available. The most common type is the *revolver*. The second most popular type is the semiautomatic or the *autoloading pistol*. The third type, the *single-shot pistol*, is produced in limited supply.

The Revolver

Figure 19.1 shows the basic parts of a revolver—the *barrel, frame, cylinder, cylinder release button, hammer, trigger, stock, sights,* and *action*.

The Barrel. The *barrel* of a revolver is often a part of the frame. Some barrels, however, screw into the frame. The standard barrel lengths are 4 and 6 inches. Some pistols are available with 2-inch barrels. Snub-nosed revolvers have even shorter barrels. Others have barrels of 8 or 10 inches in length.

Barrels vary greatly in quality and price. Revolvers often have heavier barrels of high precision. This added weight aids the shooter in holding the pistol steady when aiming. These revolvers often have a raised rib, similar to that found on some shotguns.

The Frame. The *frame* of a revolver should be heavy enough to withstand the recoil of the cartridge. Some manufacturers use a solid frame, while others use a frame of several pieces. The rear sight is located on top of the frame, and may be simply a groove in the top of the receiver. The barrel and frame of quality pistols are made of high-grade steel. They are then blued. Some are plated with chrome or nickel. (Some pistols have barrels, cylinders, and receivers made of stainless steel.)

The Cylinder. The *cylinder* of a revolver is round, with a center shaft that connects it to the frame and allows it to revolve. The cylinder serves as a magazine for a revolver, usually with six holes into which cartridges are placed. Several manufacturers produce revolvers with cylinders that hold five, or nine, cartridges.

The holes in the cylinder also serve as the chamber for each cartridge. The cartridge is fired while positioned in the cylinder. Some .22 rim-fire pistols have interchangeable cylinders. This enables the shooter to use regular or magnum .22 rim-fire cartridges.

The cylinder must be made and installed with precision, so the bullet will be in line with the barrel when the gun is fired.

The cylinder must rotate before each shot. When the hammer is raised, the cylinder is rotated. It rotates until the bullet is in line with the barrel, locks into position, and then the gun is ready to fire. A small lever or pushpin causes the cylinder to rotate as the hammer is pushed back.

The cylinder is often attached to the ejector rod. When the cylinder swings out and away from the frame, the ejector rod is pushed to eject the spent cartridges from the cylinder.

The more expensive revolvers have a *cylinder release button,* which releases the cylinder from the frame. The cylinder can then swing out and away from the frame for loading or unloading. This button is always located on the left side of the frame, and is convenient to the thumb of a right-handed shooter. Some revolvers have a rod that holds the cylinder in place. This rod allows the cylinder to be removed from the gun, and is then used to push each cartridge from the cylinder.

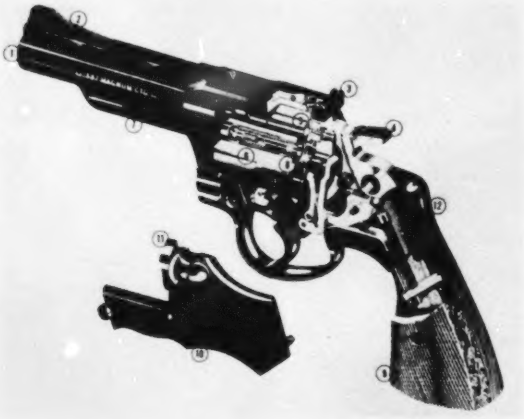


Fig. 19.1. A cutaway view of a revolver reveals the following parts: (1) muzzle end of barrel assembly; (2) ramped-blade front sight; (3) adjustable rear sight; (4) thumb-action hammer spur; (5) cartridge in chamber and firing pin assembly; (6) cylinder; (7) ejector rod; (8) ejector blade; (9) hand-checkered walnut stock grips; (10) receiver plate; (11) thumbpiece; and (12) frame.
(Courtesy Colt's Firearms Division, Colt Industries)

The Hammer and the Trigger. Most revolvers have exposed hammers. The *hammer* is shaped in a way that it is easily pulled back by the shooter's thumb. The *trigger* is attached to the cocking mechanism. When it is pulled the hammer falls, and the cartridge is fired.

Some manufacturers give a customer the option of ordering a special target trigger and hammer with a revolver. Target triggers and hammers are usually wider than normal. They provide more surface to contact the thumb or finger.

The Stock. The *stock* of a pistol is often called the handle or grip, and it must fit the hand if the shooter is to attain accuracy with the pistol. Various shapes are found in pistol grips. Some models must be equipped with oversized grips that are often called *target grips.*

Most pistol grips are made of walnut or plastic. Usually, they have *checkering,* or grooves, to make it easier to hold the pistol.

The Sight. The front *sight* of a revolver is located on the top of the barrel, near the muzzle. The rear sight is located on the frame, usually just in front of the hammer. The front sight is usually a blade-type sight. The rear sight may take one of two basic forms.

(1) It may be a shallow groove in the metal of the frame. This type of sight is *preset* or fixed for shooting at a target about 25 yards away. It is often used on pistols that are subject to rough treatment which might cause other sights to lose their adjustment.

(2) The second type of sight is adjustable (see fig. 19.2). Some can be moved horizontally, but not vertically. Other adjustable sights can be moved horizontally or vertically to change the point of impact of the bullet. Adjustments are made with a small screwdriver or other tool.

Telescopic sights are another type of adjustable sight which may be placed on a pistol.

Persons who intend to hunt with a pistol should consider installing a telescopic sight.

The Action. Revolvers fall into one of two action types—the *single action* and *double action*. The single-action revolver is prepared for firing only by pulling the hammer back to the cocked position, usually with the thumb. The pistol is then fired by pulling the trigger. When the hammer of a single-action revolver is in a "resting" position, it cannot be raised by pulling the trigger. The trigger is activated only when the hammer is pulled back to the cocked position.

The entire firing sequence of double-action revolvers can be accomplished by just pulling the trigger. When the trigger is pulled, the cylinder is rotated and the hammer is raised. If the trigger is pulled completely back, the hammer will fall and fire the cartridge. A double-action revolver can also be fired in the single-action style. When pulled back, the hammer of a double-action revolver will assume a cocked position, like that of a single-action gun. A double-action revolver can be fired as fast as the shooter can pull the trigger.

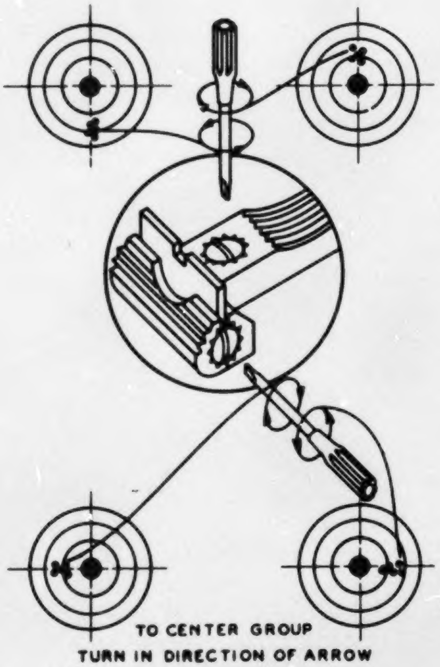


Fig. 19.2. The notched rear sight has both windage and range adjustments. Arrows show direction for aligning shots on the target. (Courtesy Smith & Wesson)

Autoloading Pistols

Autoloading pistols are designed to fire as quickly as the shooter pulls the trigger. This pistol operates on the same basic principle as autoloading rifles. Although this pistol is often called an automatic pistol, it is actually a semiautomatic pistol. In the following section, the autoloading pistols' *action, magazine, barrel,* and *handle* are described.

The Action. Autoloading pistols work like autoloading rifles. Part of the gas from the cartridge is used to force the breech block back away from the chamber. As the action slides back, a cartridge in the clip is allowed to move upward. When the return spring pulls the slide back into its original position, it pushes a cartridge into the chamber and secures it there. The chamber is located in the barrel of the pistol. Some models have exposed hammers, but most do not. Most autoloaders have a firing pin enclosed in the action, and no hammer is used. Those with external hammers also have firing pins inside.

Many pistols have a safety feature that causes the action to stay open when the last cartridge is fired. The slide remains in its open position, and this lets the shooter know that the gun is empty.

The Magazine. Most autoloading pistols have a *clip-type magazine* that holds from 5 to 14 rounds of ammunition (see fig. 19.3). It is housed in the handle of the pistol. A release button at the bottom of the handle can be pushed to remove the clip from the bottom of the handle.

The Barrel. The *barrel* of an autoloading pistol is often screwed into the frame. Some pistols have barrels of different lengths. These barrels can be changed. Target pistols often have very heavy barrels, sometimes called "bull barrels." They help the shooter steady the pistol when aiming at a target.

The Handle. The *handle* of an autoloading pistol is usually straighter than a revolver's. It houses the magazine. Grips are made of plastic or walnut for most guns. The handle should always fit the shooter's hand.

A salesperson should remember that autoloading pistols are usually more accurate than revolvers. Serious match shooters almost always use semiautomatic pistols. However, these are hardly ever bought "off the shelf." Do not mislead a novice into buying a gun to "go to a match."

Single-Shot Pistols

A few single-shot pistols are produced in the United States. Most of these have a break action, like a single-shot shotgun. Some of these pistols have a bolt action.

Single-shot pistols (see fig. 19.4) are usually chambered for large-caliber pistol cartridges. A cartridge developed by Remington for its single-shot pistol is the .221 Remington Fireball. This bullet leaves the muzzle at a speed of 2,650 feet per second. Thompson Center's Contender pistols are available in some rifle calibers. These include the .30/30 Winchester and the .35 Remington cartridges. Wichita Engineering produces a bolt-action single-shot pistol that can be chambered for the .308 or the 7 mm cartridges.

The single-shot pistols are often used for hunting. It is likely that hunters of deer and other big game will seriously consider single-shot pistols chambered for rifle cartridges.

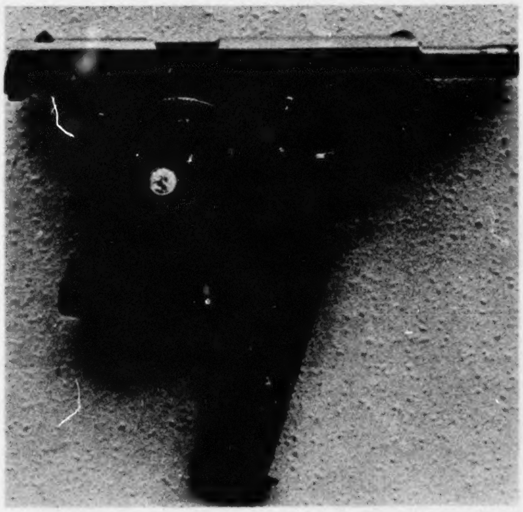


Fig. 19.3. Autoloading Pistol with Clip Magazine (Courtesy McBride's Gun Store, Austin, Texas)

Cartridges for Handguns

Cartridges used in handguns can be divided into the same two categories as rifle cartridges: rim-fire and center-fire.

Pistols chambered for the .22 rim-fire cartridges use the same cartridges as the .22 rim-fire rifles. Many autoloading pistols are chambered for the .22 long rifle cartridge. Most of these will not handle .22 long or .22 short cartridges. The action is designed to handle only the .22 long rifle cartridge, which is longer than the other two.

Center-fire cartridges used in pistols are similar to cartridges used in rifles. They contain the *cartridge case, primer, powder,* and *bullet.*

Pistol cartridge cases are usually shorter than those for rifles of the same caliber. The reason for this is that pistol bullets are intended to have less velocity and range than rifle bullets. Most rifle bullets leave the muzzle at a speed of over 2,000 feet per second. The bullet velocity will vary according to the weight and powder charge.

Most .45 caliber pistol bullets have a velocity of 810 feet per second as they leave the muzzle. The greatest velocity for a .38 special is 1,175 feet per second, and the lowest velocity for that bullet is 635 feet per second. These velocities were reported in the ballistics tables of one ammunition manufacturer. Ballistics may vary slightly from one manufacturer to another (see fig. 19.5).

Pistol bullets are fairly heavy, as compared with rifle bullets. Almost all .40 caliber pistols fire bullets that weigh over 200 grains. The .45 Colt cartridge contains a bullet that weighs 250 grains. These large bullets, traveling at a fairly low velocity, have tremendous shock power.

Several types of pistol bullets are used. The round-nosed lead bullet is found in most cartridges. This solid lead bullet is good for general use. The .22 rim-fire cartridge has a round-nosed hollow-point bullet.

Most center-fire autoloading pistols shoot metal case (jacketed) bullets. Jacketed bullets are lead bullets covered with a jacket of gilding

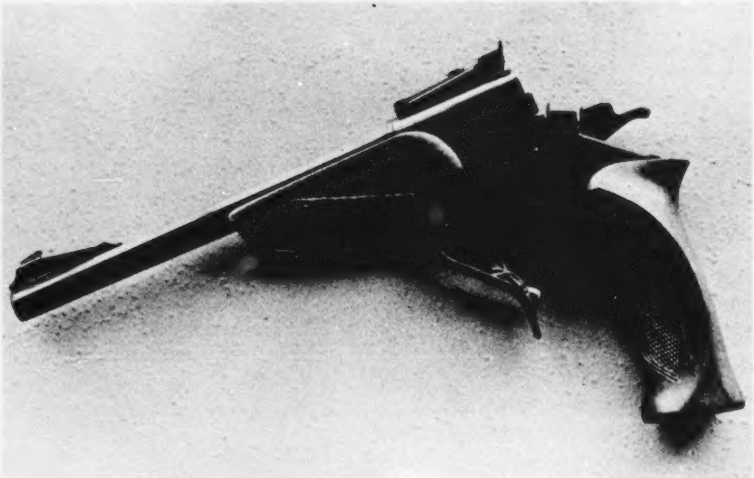


Fig. 19.4. *Top-break, Single-shot Pistol with Action Open*
(Courtesy McBride's Gun Store, Austin, Texas)

Cartridge	Weight of Bullet	Muzzle Velocity (feet per second)
.22 Long Rifle	40	1150
.221 Rem. Fireball	50	2650
.25 Auto Pistol	50	810
.32 Long Colt	82	755
.357 Magnum	158	1235
.38 Special	125	945
.38 Special	200	635
.44 Magnum	180	1610
.44 Magnum	240	1350
.45 Colt	250	860

Fig. 19.5. *Muzzle Velocities of Selective Pistols*
(Courtesy Remington Arms Company)

metal. This makes the cartridge easier to load into the chamber, because the metal is slicker than a lead bullet. The metal jacket also keeps the bullet from developing nicks or burrs, as is possible with a lead bullet. The jacket often leaves the point of the bullet exposed. These bullets may have a hollow point for quick expansion of the bullet.

The wadcutter bullet has an unusual shape. It is shaped like a cylinder and has flat ends. This bullet is designed to be very accurate and to cut cleanly through a paper target. Some handguns are designed specifically for shooting wadcutter bullets.

A handgun can be chambered for one of many pistol cartridges. In addition to .22 rim-fire cartridges, one ammunition manufacturer produces 23 pistol cartridges. Each cartridge then has its own range of loads, including different bullet types and weights.

As with rifle cartridges, one must be careful to use the correct cartridge in the pistol. What sounds logical is not always correct. For example, a .38 special cartridge can be fired in a pistol chambered for the .357 magnum cartridge. *A person must not try to fire a .357 magnum cartridge in a pistol chambered for the .38 special cartridge.*

Five .32 caliber cartridges are manufactured, and each is different. Three .45 caliber cartridges are produced. Each has a different cartridge case, and it may not be interchanged with another. If a customer is not clear about the ammunition to buy, be sure to warn him or her to use only the ammunition indicated for the pistol. The cartridge to use in a pistol is stamped into the metal of the barrel or frame of the pistol.

Shooting the Handgun

If the customer is not experienced in handling guns and is considering a revolver or automatic pistol for the first time, he or she may appreciate a few helpful suggestions from the salesperson. Handling and shooting a handgun is different and demands different disciplines than those required for rifles and shotguns. Being able to shoot any gun has one requisite—being able to maintain proper sight-to-target alignment from the time the trigger is pulled until the bullet leaves the muzzle. With a rifle, the shooter has more control because the gun is positioned against the shoulder and is held by both hands. It may also be rested against the side of a tree or from the top of a rock to give even greater steadiness. With a handgun, however, the shooter does not have this control (see fig. 19.6).

It would seem that the handgun's smaller size and reduced weight would provide the shooter with simpler handling, but this is not the case. The shorter length makes steadiness even more important because there is a greatly reduced space between the two sights. A mere fraction of an inch of movement or misalignment throws the bullet off course by a considerable distance.

The handgun should be gripped so that the butt fills the hand comfortably, allowing the sighting plane to fill the space between the index finger and the thumb. It should be held tightly enough that the recoil will not cause it to shift from the original grip. The shooter should place his thumb along the pistol frame almost parallel with the trigger finger. The thumb should never stick up at an angle. The index finger should rest firmly against the trigger but should not touch the grip at any place along the side. The remaining three fingers support and hold the handgun. The index finger should touch the trigger with the fleshy tip of the first joint, never the bend or portion of the second joint. In order to maintain steadiness when the gun is raised to firing position, the axis of the barrel and the shooter's forearm should be perfectly aligned to reduce sway or involuntary muscle spasms. Refer to the figure 19.6 on proper positions.

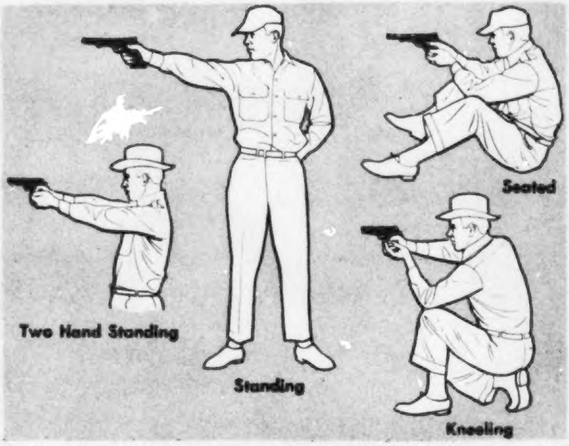


Fig. 19.6. *These positions are recommended for accurate handgun firing.*
(Courtesy Browning Arms Company)

In all but the standing position, the palm and fingers of the other hand may be used to hold and steady the gun hand. The butt should rest firmly in the palm with the fingers giving a light grasp to the fingers of the other hand that clasp the stock.

Perfect pistol sight alignment is achieved when the top of the front sight is level with the top of the rear sight (see fig. 19.7). The same amount of daylight should appear on either side of the front sight blade as it rests between the sides of the notch on the rear sight. The center of the front blade should be positioned at 6 o'clock on the bull's-eye of the target. The most important step for the novice handgun shooter to practice is that of concentrating the

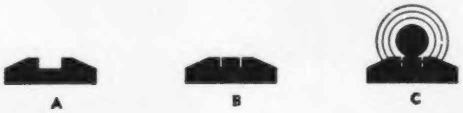


Fig. 19.7. *(A) Rear sight plus (B) front sight in exact center of rear notch, flush with top, plus (C) a six o'clock hold on aiming bull equals perfect sight alignment.*
(Courtesy Colt's Firearms Division, Colt Industries)

eye on the pistol sights rather than on the target. If sight alignment can be properly maintained, accuracy will automatically result. The shooter should not worry if the target appears hazy. Steadiness and proper trigger squeeze should be the area of greatest concentration.

The trigger movement is proper when the finger is pulled in a straight line and when the pressure is one of squeezing rather than yanking or pulling. The proper trigger squeeze comes with muscular coordination that pulls straight back at the precise moment when the sights are perfectly aligned on the target. This is a crucial time in handgun accuracy. The novice will usually tighten her grip while squeezing the trigger, thus pulling the sights out of alignment.

The best method of practicing trigger squeeze and sight alignment is dry-firing, but this is not recommended on all types of handguns. On many handguns, dry firing (the pulling of the trigger on an empty chamber) is injurious to the mechanism. On some makes and models, a special lever allows dry-firing with a partial hammer pull that perfectly simulates actual firing. In this manner, the shooter may carefully observe his handhold, his index finger squeeze, and any movement he may be giving to the pistol while pulling the trigger. Target alignment is easily practiced with an empty handgun, but accuracy is attained only by firing at a target with live ammunition.

Questions

1. What are the four main reasons people buy pistols?

2. What is the smallest pistol caliber allowed for big game hunting in most states?

3. What are the three basic types of handguns?

4. What are the standard barrel lengths of a revolver? What other lengths are available?

5. Why are some revolvers called *six shooters?*

6. How is a *target trigger* or *target hammer* different from a normal trigger or hammer?

7. What are the two revolver actions?

8. What kind of magazine is found in an autoloading pistol, and where is it located?

9. Which is most accurate, the autoloading pistol or the revolver?

10. How does the velocity of a pistol bullet compare with that of a rifle bullet?

11. How can one know for sure which cartridge should be used in a pistol?

Projects

1. Prepare a feature-benefit analysis sheet for each of five pistols handled by your store. Use at least one revolver, one autoloader, and one single-shot pistol.

2. Ask your employer to identify the best-selling pistol in your store, and to explain why it is so popular.

20

Air Guns

Objectives: *After completing this assignment, you should be able to—*

1. *tell how shooting an air gun can help one learn not to pull a gun off target when pulling the trigger;*
2. *cite the components that are critical to the life of a spring-compression air gun;*
3. *tell what happens when the trigger is pulled on a pneumatic-action air rifle;*
4. *tell what the symbol CO_2 stands for, and describe its use in CO_2 cartridge guns; and*
5. *describe the type of barrels on pellet guns.*

Air rifles are sold in most sporting goods stores. Some of the less expensive spring-type guns are sold in general merchandise and toy stores. Most of the more powerful pump and cartridge air guns are sold only in sporting goods stores. Precision-made air guns that often sell for $400 or more are handled by only a limited number of stores. The subject of air guns covers more than just the inexpensive BB guns with which most people are familiar.

Uses of the Air Gun

Many people consider air rifles to be toys. This is a dangerous attitude. These guns shoot missiles that can cause severe injury. An air rifle should be handled as carefully as any firearm. When properly handled an airgun can be useful in several ways.

Teaching Gun Safety

An air rifle "accident" can be a serious matter and may cause a serious eye or facial injury. Most air rifle accidents result in a painful bruise. Even though these are serious accidents, they do not have the fatal potential of an accident involving a firearm. For this reason, many experienced shooters use air rifles to teach gun safety to children.

The young shooter quickly learns not to bring a cocked gun into the house and to wait until ready to shoot before cocking the gun. The young shooter learns not to point the gun at people or anything else that isn't a target. He or she also learns to carry the gun correctly and to properly care for the gun.

Developing Accuracy in Shooting

A new shooter can use an air rifle to learn the techniques necessary for shooting accuracy with a firearm. Sight alignment is the same for both types of guns.

One of the main problems in achieving accuracy is pulling the sights off the target when the trigger is pulled. Shooting an air rifle can help, since it has no recoil and no report or noise when fired. This reduces the chances that the shooter will develop a flinch as a reaction to pulling the trigger.

Some air rifles, especially the inexpensive BB guns, have stiff triggers. It is easy to pull the gun off target when the trigger is pulled. With an air rifle, it is often easy to see the rifle pull off target. A careful shooter will learn to squeeze the trigger in order to eliminate this problem.

A hunter using an air rifle must learn to compensate for its limited range. The hunter must learn to stalk game and not attempt a shot from too great a distance.

Learning Instinct Shooting

Most instructors use air rifles to teach instinct shooting. This is a shooting technique that combines eye and hand accuracy to produce spectacular shooting results. After a short time, one can easily hit as small a target as an aspirin thrown into the air.

Target Practice

Some shooters use air rifles to help them maintain shooting accuracy during the off-season. An air rifle does not always match the weight of the hunter's rifle, but the sighting and the trigger squeeze are similar.

The air rifle can be used in a basement or in the backyard without bothering neighbors. The cost of air rifle ammunition is much cheaper than that of a firearm. Some might question using air rifles in this manner. It is true that an inexpensive BB gun is not extremely accurate. However, some of the better air rifles are very accurate and provide for good target practice.

Competitive Shooting

Some organizations now sponsor shooting matches for younger shooters in which only air rifles are used. Serious adult competition usually involves the use of the more expensive precision-made air rifles.

How Air Guns Work

Air guns are produced in the form of rifles and pistols. The projectile is propelled down the barrel and toward the target by a burst of gas that is released behind the projectile. The gas is usually ordinary air or carbon dioxide. The burst of gas that pushes the projectile toward the target may be provided in three different ways.

Spring-Compression Guns

The simplest system consists of a piston that is attached to a strong spring located in a cylinder. When the gun is cocked, the spring is compressed. When the trigger is pulled, the spring instantly returns to its original size. This causes the piston to move toward the end of the enclosed cylinder at a very rapid rate, compressing the air in front of the piston.

This compressed air is allowed to escape into the barrel, behind the BB or pellet, pushing it down and out of the barrel at a high velocity. The BB leaves the barrel at about 300 feet per second and will travel 30 or 40 yards. The effective accuracy range is 10 to 15 yards.

This system is found on most of the inexpensive air rifles and is fairly durable (see fig. 20.1). An air gun with this type of action may last for several years. The life of the gun depends upon the life of the spring, how well the cylinder remains sealed, and how well the edges of the piston are sealed against the walls of the cylinder.

Pneumatic-Action Guns

Some air rifles have an air chamber in which air is compressed by working a lever or pump. These guns are usually able to develop more power than spring-compression guns (see fig. 20.2). While the spring-compression gun's lever is worked only once, this gun's lever may be worked several times to produce more power. Each time the lever or pump is worked, the air in the air chamber is compressed more tightly. When the trigger is pulled, the air in the compression chamber is released into the barrel, behind the BB or pellet, pushing it through the barrel and toward the target.

The muzzle velocity of the BB or pellet is about twice that of a BB from a spring-compression gun. The range of the BB or pellet from a pneumatic-action gun is greater than that from a spring-compression gun. Good accuracy can be expected at 20–25 yards.

CO_2 Cartridge Guns

Guns powered by CO_2 cartridges usually have a uniform velocity from one shot to the next. CO_2 is the chemical symbol for carbon dioxide. The cartridge comes with a certain volume of CO_2 that has been compressed into the cylinder. When the cylinder is placed in the gun, it is punctured at one end. The gas in the cylinder will then come through the puncture hole as it is needed.

The gun's action (see fig. 20.3) regulates the flow of the gas and a certain volume of CO_2 is metered out for each shot. When the trigger is pulled, the gas pushes the pellet through the barrel and toward the target.

A small cartridge will deliver enough gas for 35–40 shots. The power of the shot can be regulated on some of the most expensive rifles.

Some air guns are single-shot, while others are repeaters. Most of the spring-compression guns have magazines built into the barrel which hold 100 or more BBs. The BB moves into the

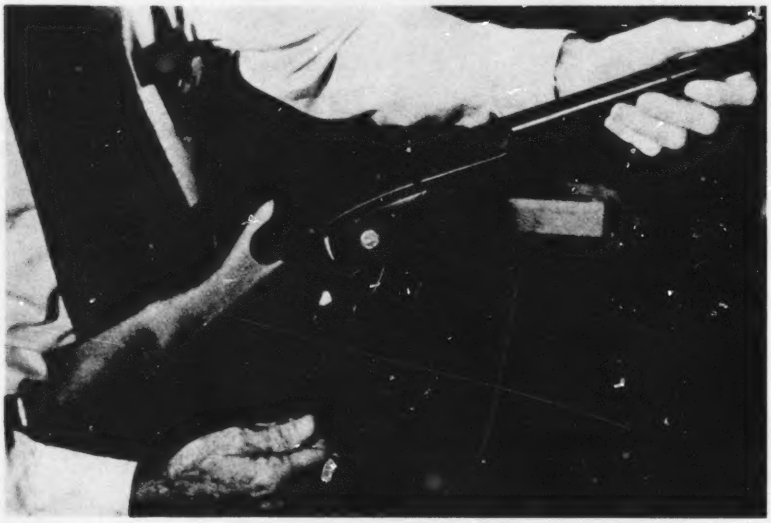


Fig. 20.1. Daisy Spring-compression Air Rifle with Action Open
(Courtesy Oshman's Sporting Goods, Austin, Texas)

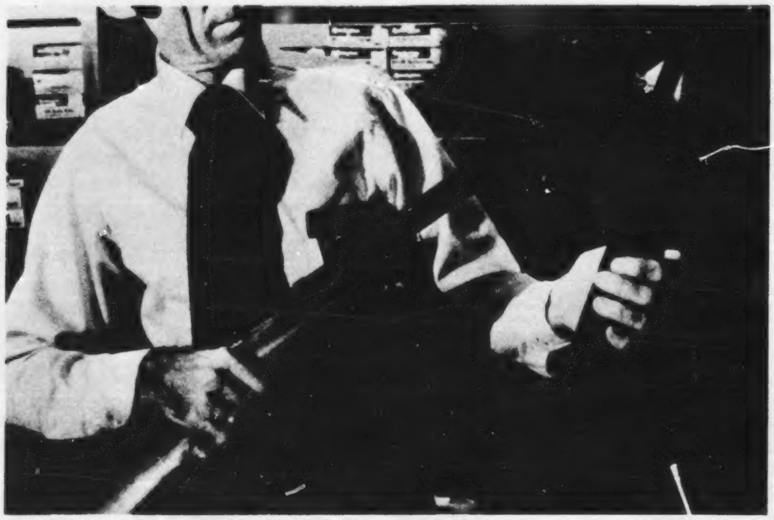


Fig. 20.2. Pneumatic Air Rifle with Action Open
(Courtesy Oshman's Sporting Goods, Austin, Texas)

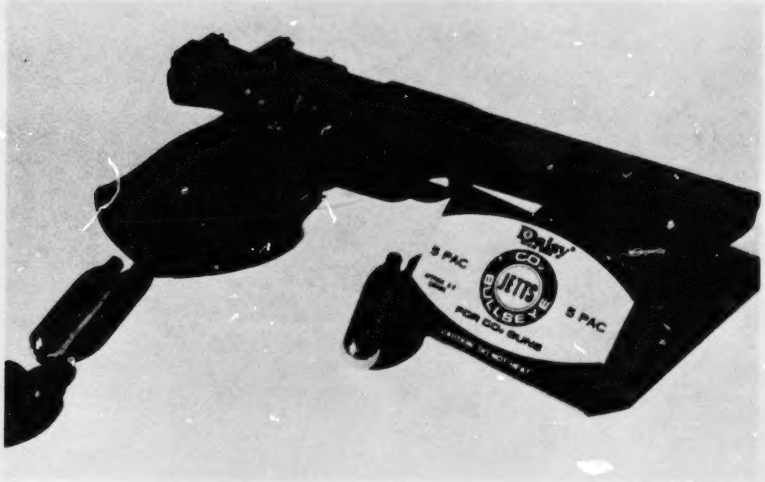


***Fig. 20.3.** CO_2 Cartridge Pistol with Replaceable Cartridge*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

breech when the gun is being cocked. The majority of the moderately and high-priced air guns are single-shot guns. However, some have magazines and are repeater-type guns.

Ammunition for Air Guns

Air guns shoot three kinds of projectiles. The most familiar is the *standard-sized BB*. This is a copper-plated, round steel shot of .177 caliber. Some .22 caliber round lead balls are produced for use in guns that normally shoot .22 caliber pellets.

Lead pellets come in two sizes. These include the .177 caliber and .22 caliber pellets. The pellets have a slightly rounded nose and a flared skirt. The skirt seals the barrel to prevent gas from escaping during the time the pellet is going down the barrel.

The third type of projectile is a *lead dart*, usually a .22 caliber projectile.

The Barrel

Most spring-compression guns have a smooth barrel. The BB does not necessarily spin as it leaves the barrel. Those guns that are designed to shoot pellets have rifled barrels, which give the pellets stability and improve accuracy.

Questions

1. How can an air gun help one learn not to pull the gun off target when pulling the trigger?
2. What determines the length of the useful life of a spring-compressed air gun?
3. What happens when the trigger is pulled on a pneumatic-action air rifle?
4. What does the symbol CO_2 stand for? How is velocity affected in a CO_2 cartridge gun?
5. What kind of barrels do pellet guns have?

Projects

1. Do a feature-benefit analysis sheet for a pellet gun.
2. Use sheets of thick paper to test the penetration power of three different air guns sold in your store.

21

Selling Reloading Equipment and Components

Objectives: *After completing this assignment, you should be able to—*

1. *give three reasons people choose to reload ammunition;*
2. *tell how many times a shotshell hull can be reloaded;*
3. *describe how lead shot is packaged;*
4. *cite the most serious mistake that is likely to occur when reloading ammunition; and*
5. *tell why it is important that a salesperson should consult reloading charts before recommending components to a customer.*

Many shooters now reload their own shotshells and cartridges. For this reason, the "reloading industry" is growing and several companies now produce reloading machines and accessories. Several others produce the reloading components. These components include *primers, shot, bullets, wads, powder, cartridge cases,* and *shotshell hulls.* Any sporting goods salesperson will need to know about reloading.

Why People Reload Shotshells and Cartridges

There are three main reasons why people choose to reload ammunition. First, it is economical. Second, reloading makes it possible to produce the cartridge or load that best suits a particular gun. And third, reloading is a hobby for some.

Reloading Is Economical

The economy of reloading varies according to current prices. Generally speaking, one can reduce the cost of ammunition by one half by reloading. It is true that the equipment is relatively expensive. However, anyone who shoots regularly will quickly regain the cost of the equipment purchased. A skeet or trap shooter can easily use four or more boxes of shotshells during an afternoon of shooting. Since the empty shells can be used again, this person can definitely save money by reloading. The same is true of a person who enjoys practicing with a rifle or pistol.

Reloading Produces Precision Ammunition

Factory-loaded ammunition should be considered "average" ammunition, in most cases. The manufacturer must produce ammunition that will perform satisfactorily in all guns. A .270 rifle cartridge must be able to fit into any .270 rifle. The rifle may be old or new, with a long or a short barrel. It may have been fired only 50 times, or it may have been fired 500 times.

Anyone familiar with guns knows that each one is individual. Each has its own head space, rifling, and so on. For best results, a shooter must experiment to discover the best load for the rifle.

The reloader may find that one Winchester Model 70 .270 rifle requires a particular powder load and bullet, while another Winchester Model 70 .270 rifle shoots best with a slightly different load. Reloading enables the shooter to develop the right load for a specific gun. The right load will vary, according to the type of game hunted.

Reloading Is a Hobby

According to one author, an hour of reloading ammunition was enough to relax him and help him forget his troubles awhile. Some people reload ammunition for the relaxation. Others reload because they enjoy experimenting with various combinations of powder, bullet weights, and so on.

Still, ballistics and reloading is an interesting and challenging hobby. It must be done, however, in a sensible way or it can be dangerous.

Ammunition Reloading Procedures

Several reloading machines are produced today. Most are operated in a similar sequence of steps as a shell or cartridge is reloaded. Some machines reload rifle and pistol bullets. Others reload shotshells.

Reloading Shotshells

Most modern shotshell hulls can be reloaded. The reloader should inspect each hull to be sure it is in good condition. Most shotshell hulls can be reloaded at least three times. Some may still be in good condition after being fired several more times. The reloading of shotshells with a machine usually involves the following steps (see fig. 21.1):

1. A primer punch pushes the old primer out of the base of the shell.
2. The shell is resized. This is sometimes done at the same time the old primer is removed. This process straightens the old crimp and prepares the shell for loading.
3. The new primer is put into place on the machine. A lever is pulled which forces the base of the shell down onto the primer. The pressure of this action seats the primer.
4. The correct amount of powder is placed in the shell. This is usually done by pushing a lever which allows a predetermined amount of powder to drop into the shell.
5. The wad and shot collar are seated in the case. Usually together in one piece, they are forced into the shell by pulling the lever.
6. The shot is placed into the shell.
7. The shell is crimped in two steps. One step uses the starter die which begins the crimping process. The second step uses a crimping die that produces a tighter crimp.

Reloading Rifle and Pistol Cartridges

Most center-fire rifle and pistol cartridges can be reloaded several times. Rim-fire ammunition is not usually reloaded. The reloading of

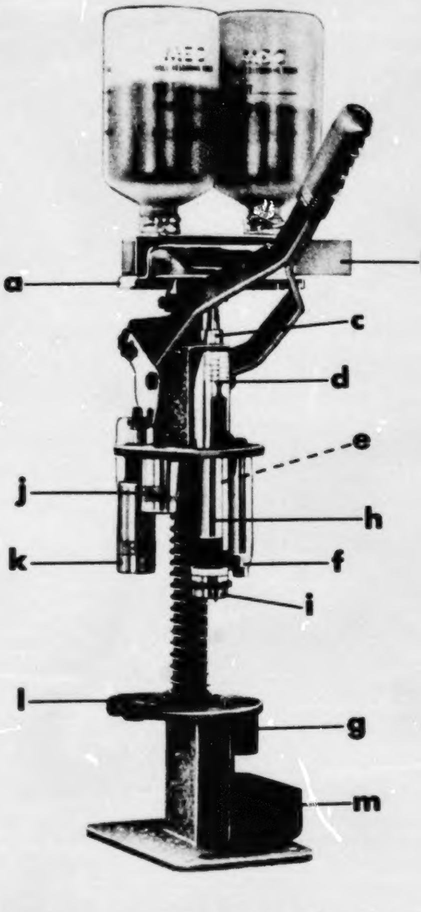


Fig. 21.1. *The component parts of a shotshell reloader include (a) measuring assembly for both powder and shot; (b) charging bar that meters powder and shot; (c) wad height indicator; (d) wad pressure gauge; (e) resizing die for shell case; (f) repriming punch; (g) primer seating mechanism; (h) rammer tube; (i) wad feed tube; (j) crimp starter; (k) crimping die; (l) shell case holder; and (m) ejected primer catcher. (Courtesy Mayville Engineering Company)*

rifle cartridges with a machine usually involves the following steps (see fig. 21.2):

1. The cartridge case is resized and the old primer is removed. The case is often lightly lubricated, so it is less likely to stick to the die during the reloading process. Resizing the case means squeezing it down to its original size. The case expands slightly when fired.
2. A new primer is inserted into the case.
3. The neck of the cartridge is slightly expanded, so it can later accept the bullet. If the neck has stretched so that it is too long, it must be trimmed so the cartridge will fit into the chamber.
4. The powder is placed in the cartridge case, an important step. The powder should be weighed on a powder scale to ensure that the correct amount is used. Powder measures may be used, but they are not usually as accurate as a powder scale. Too much powder can create a dangerous situation. At best, it will usually shorten the life of the barrel.
5. The bullet is seated at its proper depth in the cartridge case. Pushing the bullet into the cartridge case usually seals the bullet satisfactorily. Handgun ammunition is usually crimped around the heel of the bullet to seal the cartridge.

Several basic kinds of components are used during the reloading of ammunition. They are briefly discussed in this section.

Primers

A primer is the device that explodes when hit by the gun's firing pin. Its small explosion causes the smokeless powder to begin to burn. Primers are not all alike. It is important that the correct primer be used when reloading.

Shotshell Hulls

The shotshell hulls reloaded by most shooters were once factory ammunition. Most reloaders buy a box of shotshells, shoot them during a hunt, and then reload them. Others prefer to buy hulls that are manufactured only for reloading purposes. These seem to be an extra cost, but they often last longer than those produced as factory ammunition.

Rifle Cartridge Cases

Most rifle cartridges that are reloaded were once factory ammunition. They are reloaded after they are fired. However, it is possible to buy cartridge cases produced especially for reloading.

Shotshell Wads and Shot Collars

Most wads and shot collars now are one piece of plastic. The correct wad and shot collar must be used when reloading a shotshell. If not, it is possible that the shell will not crimp properly.

Lead Shot

Lead shot is usually sold in cloth sacks that weigh 25 pounds each when filled with shot. The shot comes in several sizes. The increasing price of shot is causing an increase in the cost of reloading shotshells. Steel shot is not as common but will be carried by many stores in areas where steel shot is required.

Bullets

Several manufacturers produce bullets. Some who reload ammunition try to make their own bullets. A serious reloader will experiment to determine the best weight and best shape for bullets that are to be fired in a particular gun.

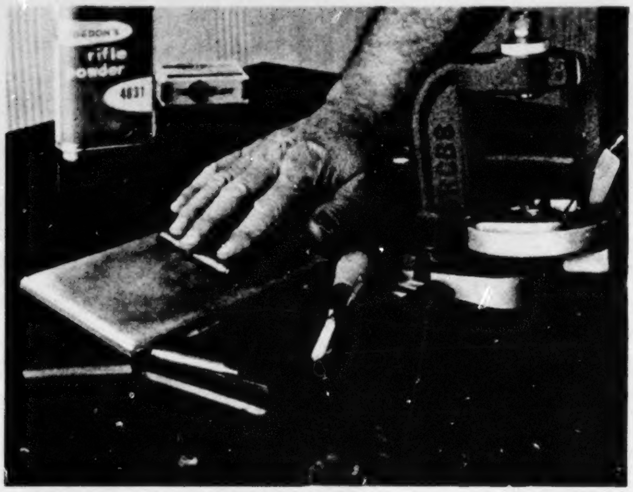
Important Information

Reloading ammunition can be fun and profitable, but it is still a serious undertaking. *The most serious problem that is likely to occur is a mistake in the kind or amount of powder used.* The powder used in a shotshell is different from that used in a rifle cartridge. The use of shotshell powder in a rifle cartridge is dangerous. The powder burns too quickly, and the barrel is likely to explode because of excess pressure.

It is also important to use the proper primer for the cartridge of shotshell being loaded. In loading shotshells, for example, you will find that various combinations of components may be used. These combinations often depend upon the types of hulls being used.

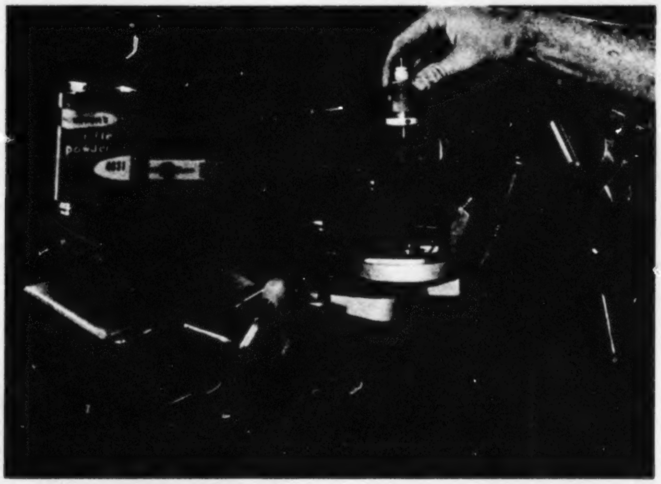
This is also true for wad columns in shotshells. Some are longer than others. The wrong

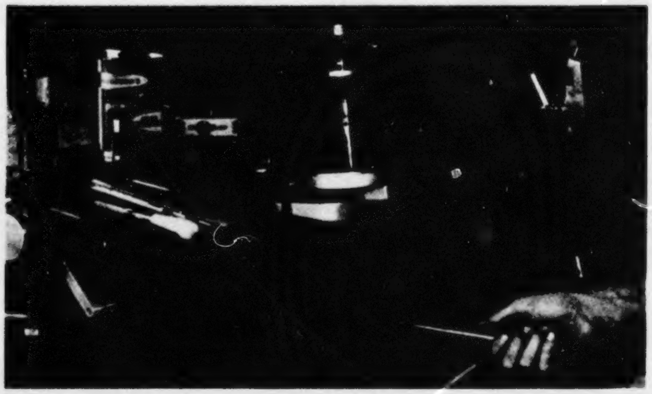
Fig. 21.2. Reloading a Rifle Cartridge



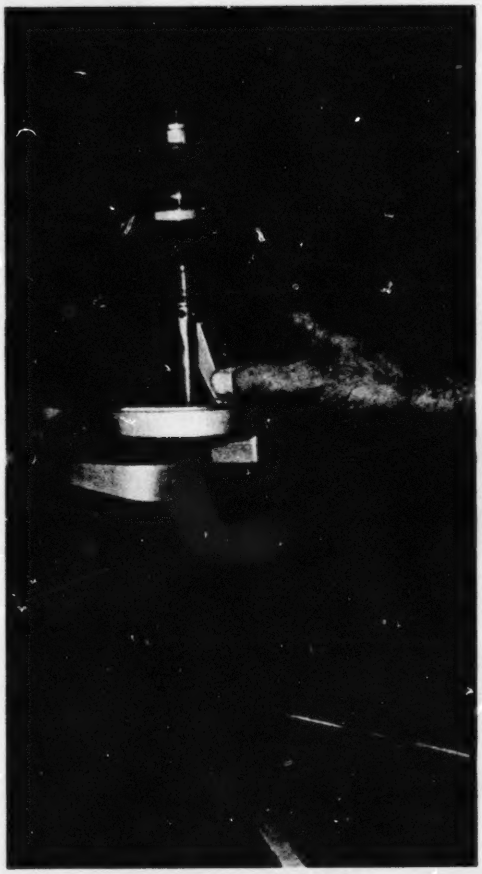
Case is lightly lubricated before resizing.

Resizing die is screwed into press frame.

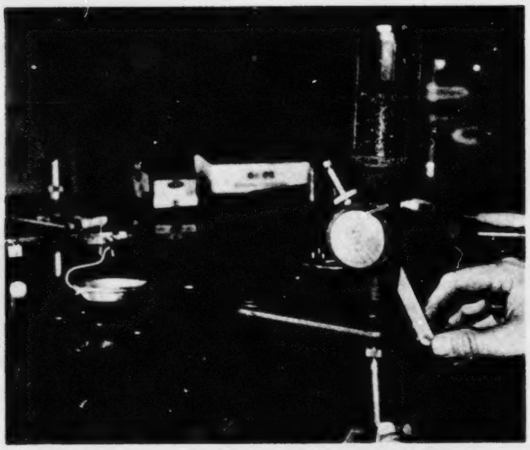




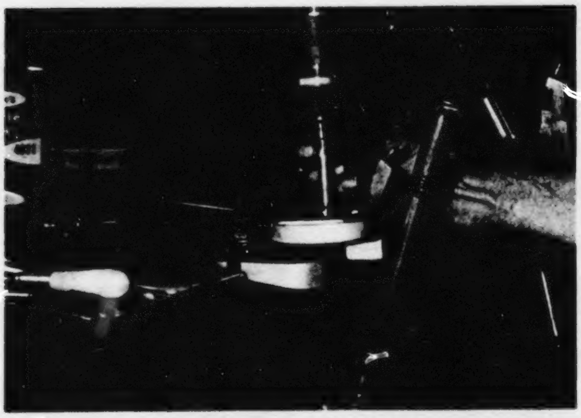
Cartridge case is forced into resizing die.



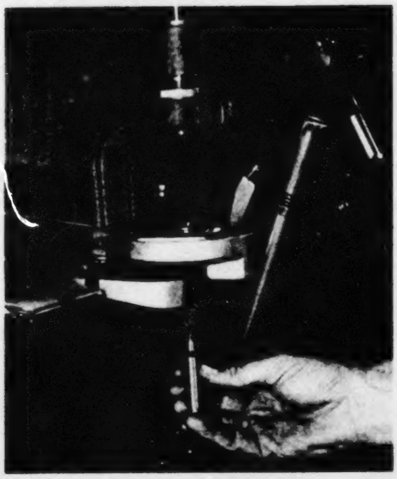
Primer is reseated in case head as cartridge is lowered.



Powder is metered and funneled into cartridge case.



Bullet is placed in mouth of cartridge case.



Finished reload is taken from press ready for firing.

(Courtesy of RCBS, Incorporated, and John Jobson) wad column may make it impossible to crimp the shell properly.

If your store handles reloading components, it is extremely important that you learn about the problems encountered in reloading, as well as the advantages. You should always refer to manufacturers' charts when recommending reloading components. A mistake by a salesperson when recommending a combination of components could lead to serious injury to a customer.

You will probably quickly memorize some of the most common combinations. Even then, it is best to consult a reloading guide before completing the sale.

It is important for the person reloading ammunition to use the brand of powder indicated in the reloading charts. Most powder manufacturers provide charts to sporting goods stores and to their customers. Mixing brands of powders may create a dangerous situation.

It cannot be overemphasized that a reloading chart must be followed exactly if reloading is to be a safe hobby.

There is also sufficient information available on the proper handling and storing of powder. As a gun salesperson, you should familiarize yourself with these rules.

Reloading Accessories

When selling reloading equipment, don't forget to try to sell the accessories. These are items that make reloading easier, and some are almost a necessity.

One of the most important accessories is a powder scale. This is a desirable accessory for shotshell loading. It is practically a necessity for rifle cartridge reloading. Cups are produced for measuring powder, but a scale is much more precise. This is important, since even a slight overload of powder can be dangerous. Funnels are also needed from time to time. Dies can be bought to enable a shooter to reload more than one caliber or gauge with a reloading machine.

A shooter who reloads shotshells or rifle cartridges might like to have an accessory that automatically feeds new primers into the reloader at the right time. Also, rifle cartridges sometimes need to be trimmed or cleaned. Accessories are available for these jobs.

Remember that "plus selling" is a service to the customer. Failing to remind the customer of a needed accessory is doing the customer a disservice. Through plus selling, you help the customer buy what is needed and you increase your store's profits.

Questions

1. Give three reasons people choose to reload ammunition.
2. How many times can a shotshell hull be reloaded?
3. How is lead shot packaged?
4. What is the most serious mistake that is likely to occur when reloading ammunition?
5. Should a salesperson try to memorize the various combinations of reloading components so customers can be served more quickly?

Projects

Prepare a feature-benefit analysis sheet for each of the following:

1. an expensive shotshell reloading machine
2. an inexpensive shotshell reloading machine
3. a rifle cartridge reloading machine
4. a powder scale

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Accessories for Hunters and Shooters

***Objectives:** After completing this assignment, you should be able to—*

1. *state what kind of apparel is used for cold-weather hunting;*
2. *name the best insulating material used for insulated clothing;*
3. *describe a **poncho;***
4. *tell why some hunters prefer the Wellington boot over the traditional hunting boot;*
5. *tell how **shooting gloves** differ from regular gloves;*
6. *explain why a deer hunter needs a strong knife;*
7. *explain what kind of light is best to use when varmint hunting.*

A visit to a sporting goods store quickly reveals that a variety of accessories are available to hunters and those who participate in shooting competition. This assignment will give you a brief introduction to some of these accessories. Individual items vary greatly from one brand or model to another.

Clothing and Footwear

Several articles of clothing and footwear can be classified as hunting apparel. The hunter is often in rough country, in all kinds of weather. Good hunting apparel is designed to make hunting more enjoyable, even under bad weather conditions. Hunting apparel includes *outerwear, underwear, boots, hats, caps,* and *gloves.* Also, hunting game bags and protective vests are included in the hunting apparel section.

Outerwear and Underwear

The labels on clothing items give a great deal of valuable information, but the salesperson must also know the uses of each item and the functions that each will perform. The number of hunting apparel items may be quite extensive. For purposes of study and selling, they may be grouped into three main classifications: *insulated clothing, noninsulated clothing,* and *waterproof clothing.*

Insulated Clothing. Insulated apparel is intended for cold-weather hunting, and this type of apparel is stocked according to geographical requirements. These are designed to provide maximum warmth with the least amount of weight and bulk and yet not restrict freedom of movement. Most insulated clothing can be classed as either jackets or pants. The jackets are full-cut through the shoulders and upper arms to provide freedom of movement and are cut closer at the waist to fit smoothly and comfortably. The jackets will usually have a knit collar and cuffs with a zipper-closure front. Some collars may be lapped.

The body shell is usually quilted, although some models may have smooth surfaces because of newer insulating materials (see fig. 22.1). Insulating materials between the two outer shells of fabric may be polyester fill which is light in weight, yet effectively retards heat flow from the body. The shell is stitched in sections to prevent the fill from moving or packing, and this gives the quilted construction. Newer insulated materials are the synthetic foams and nonpacking fills with large air spaces to trap heat. Duck and goose down are still considered to be the best insulating materials. Down-insulated clothing is more expensive than clothing insulated with man-made materials.

The pants are large and roomy, full-cut through the seat, and with cuffed bottoms at the ankle so that they fit snugly into the tops of hunting boots. The construction is the same as that of jackets. There are also one-piece insulated coveralls or jumpsuits that are gaining in popularity. These are more roomy and do not have the gap at the center, when the body bends over.

Features on insulated jackets may include recoil patches built in at the shoulder to absorb some of the gun recoil force, reinforced hand and cartridge pockets to give long-lasting comfort, rubber-lined game pockets, and protective hoods. Outer shells are usually nylon or acetate yarns, 2-ply for extra strength, and treated to be water-repellent and machine-washable (see fig. 22.2).

Features on insulated pants include a double seat and double knees for extra durability, built-in warmer pockets, storm zippers for positive weatherproof closures, and lighter insulation for less bulk.

Insulated underwear is preferred by many hunters. It has numerous applications other than those for hunting, such as for outdoor spectator events, outdoor work, and as extra-protective clothing in extremely cold conditions. It may be worn over regular underwear or be used alone under outer clothing. Most insulated underwear is filled with polyester material and quilted like the outerwear.

Nylon is the most common fabric in the outer shell because it is lightweight, but strong. Insulated underwear is two-piece, and both the jacket and underpants have the same type of construction as outerwear jackets and pants. It is usually sized in small, medium, large, or extra large. The jackets are often worn as outerwear, so sizing correctly is important.

Insulated underwear is too heavy for many regions of the United States. Thermal knits provide an extra measure of warmth under the outer clothing, but do not have the bulk of insulated underwear. These are about the same weight as regulation winter one-piece underwear. They have the extra advantage of not restricting arm movement in hunting.

Noninsulated Clothing. Noninsulated hunting apparel is designed for early fall hunting before frigid temperatures begin. These are made of heavy cotton duck (closely woven material), either lined or unlined. Some have corduroy facings on the collar and leather elbow patches for extra touches of refinement. Usually, the solid colors of brush brown (dark khaki) or forest green are preferred, but some hunters want the extra hiding power of camouflage patterns.

Most of these articles have a water-repellent finish, but this does not make them waterproof. They are particularly popular with upland-game hunters and duck hunters. The heavy duck material is warm enough to provide good protection in cool weather without causing the hunter too much discomfort from over-warm clothing. They are full-cut in the upper arms, sleeves, and chest. They are full-cut in the body section to give an extra measure of room for game, giving the hunter storage space without hampering gun movement.

Fig. 22.1. *Insulated Jacket*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

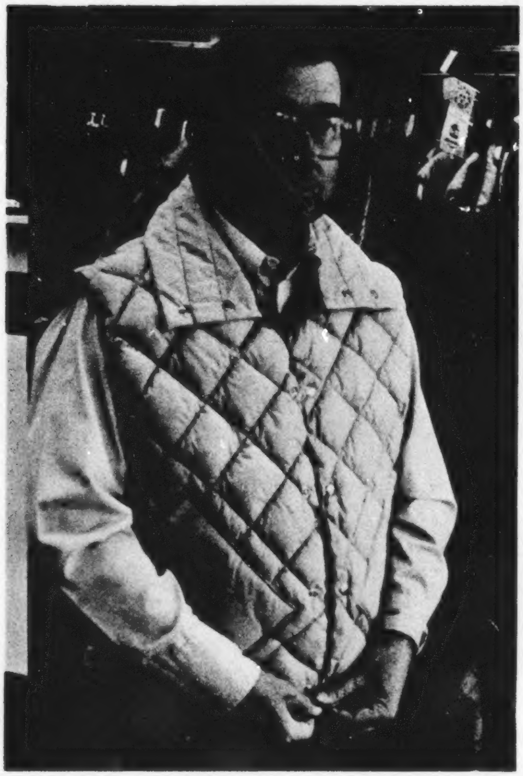


Fig. 22.2. Insulated Vest
(Courtesy Oshman's Sporting Goods, Austin, Texas)

Features on hunting jackets include cotton lining in the yoke and sleeves for extra protection; large game bags or pockets in the rear; front shell pockets; front-opening, rubber-lined game pockets; and reinforced, extra-stitched main seams for long wear and rugged use. Jackets and pants of this type must be made of durable yarns in order to avoid their being easily snagged on brush, trees, tall grass, and fences.

The pants are full-cut and roomy in the seat. The breeches may have tight legs to fit inside boots or full-cut legs to fit over boots or high-top hunting shoes. These have extra-roomy pockets, but they are not designed to carry game.

Lighter-weight versions of these same hunting clothes may be made of poplin or regular army-twill cotton cloth. Neither are as durable or as rugged as the heavy cotton duck. A good-quality hunting outfit should be washable.

Pants for waterfowl hunting may have a rubber-lined seat and knees for extra waterproof protection. For brush country, the pants and jackets may have pliable plastic in front and back to make them brierproof.

Many hunters, in warmer weather, prefer only the pants and a vest over a regulation shirt. The vest is primarily for extra shells rather than for any protection against weather or brush, although game vests have shell pockets in front and a gusseted game bag on the back. The principal advantage of a vest is that it provides extra storage room without restriction of movement of the arms and upper chest. The vest is lightweight and more comfortable than a jacket.

Trapshooters and skeetshooters have a special type of vest, preferred for their sport. These are heavyweight poplin with a leather patch on the right shoulder which serves as a recoil buffer, with shell pockets and shell loops. Primarily, their purpose is for storage and the convenience of easy access to ammunition during firing.

Noninsulated hunting apparel may be purchased separately or in matched sets. There are also several styles of hats or caps of the same material that are appropriate as hunting apparel.

Waterproof Clothing. For complete wet-weather protection, the hunter needs a type of clothing that will withstand and shed water completely. Water-repellent or water-resistant finishes will shed water on the surface, but prolonged water contact will gradually soak into the fabric and wet it. For rain, snow, sleet, and storm conditions, the apparel must have a finish that repels water completely, which means that the fabric cannot "breathe." This characteristic of storm apparel makes it much warmer, so it's generally used in cold temperature zones.

Examples of waterproof apparel are storm suits with coat and pants, coats with hoods called *parkas*, or *ponchos* (see fig. 22.3). The storm suit usually has a longer jacket that fits snugly, well below the waistline for complete protection. Flapped pockets make it waterproof, and the parka hood is attached to the collar with a flap at the throat line to prevent water from running under and down the front of the jacket.

The car coat gives less protection but is still good for most conditions; most of these have a waterproof hood attached to protect the head.

The *poncho* is a one-piece raincoat that pulls over the head. There are no arms, but the material falls over the arms for protection. The arms are left free for unrestricted movement. Ponchos are particularly adaptable to horseback riding. They are usually forest green or camouflaged to blend with the background.

Hunting Boots

Popular with all sport hunters is the great variety of hunting boots. A good boot is essential to both health and comfort. In rugged terrain, the boot is a "must" for climbing and surefootedness. In waterfowl hunting, the boot must be completely waterproof. In cold temperatures, the hunter needs the extra protection of insulated boots.

Boots may be either of leather or rubber. The waterproof boot is usually rubber, with a fully gusseted tongue to prevent leakage (see fig. 22.4). The front section may lace or buckle. The sole and heel are usually molded in one piece, with a lugged or ridged design for extra traction in wet, slippery terrain. The insole is usually fleece-lined or made of felt to cushion the foot and insulate against the cold, rubber exterior. To be comfortable, the arch should be supported with a steel shank. Extra insulation may be provided by foam or extra layers of synthetic fibers.

Insulated boots are usually made of a heavy leather outer shell with foam lining or cellular insulation. They also have a one-piece molded sole and heel with a traction tread design. The *welt* (reinforcement between lower and upper soles) is waterproof; and, generally, the toe and heel sections are reinforced to make them extra rugged. A waterproof welt, however, does not make the boot waterproof. Generally, with this type of construction, water will not seep in around the sole or through the leather while a hunter walks in the rain or wades through light snow.

A lighter hunting boot is favored for upland-game hunting and for hunting in open country. The *uppers* are of a softer leather; they have a warm, fleecy insulating material inside, and they have a molded sole and heel. These boots lace and have a full-gusseted tongue for flexible fit and roominess when the pants leg is tucked inside the upper portion of the boot.

A good boot should be extremely comfortable. It should be fitted to be roomy enough for heavy socks, and the uppers should be snug without binding or chafing. There should be a well-defined arch support, as well as good support at the ankles. The sole and heel are better if molded in one piece. When walking in rough country or over rocks, a separate heel is likely to work loose. The molded sole has better traction and grip on slippery surfaces. Also, a

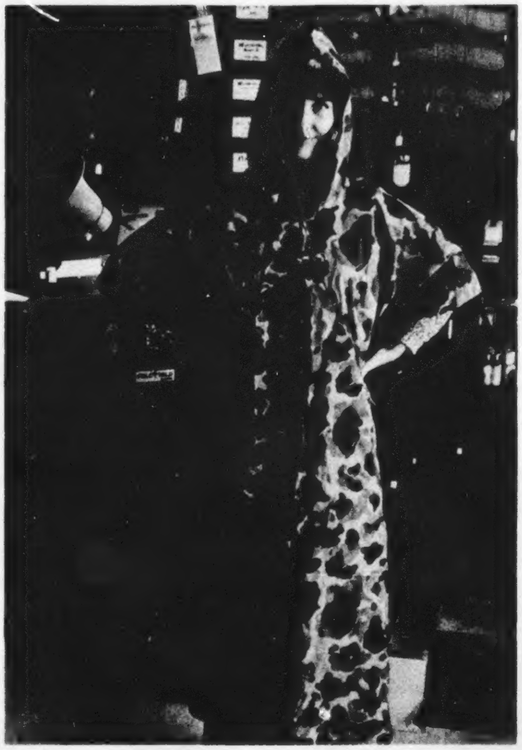


Fig. 22.3. *Poncho*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

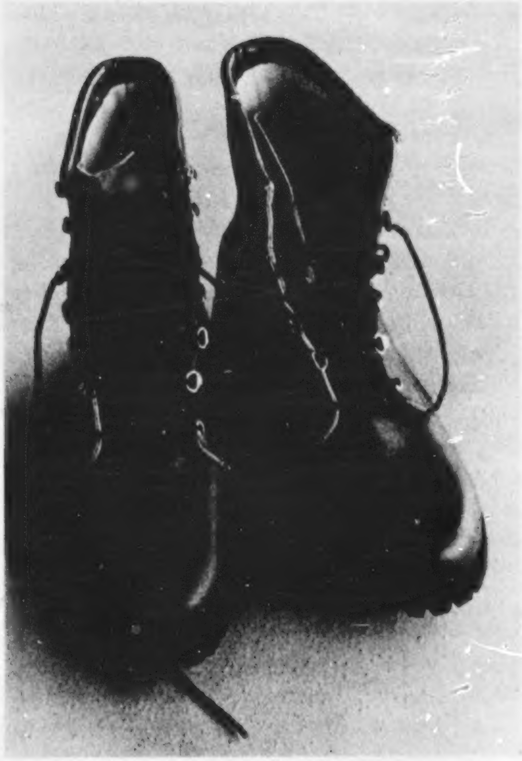


Fig. 22.4. Waterproof Leather Boots (Courtesy McBride's Gun Store, Austin, Texas)

sewn or stitched sole is more likely to work loose and eventually leak moisture.

Some hunters and shooters prefer to wear a *Wellington* boot. It is easier to put on and take off than the traditional hunting boot (see fig. 22.5). Wellingtons, with the rough side of the leather on the outside of the boot, are very popular.

Some manufacturers produce snake-proof boots that protect the hunter up to the upper calf of the leg. These are expensive but are considered worth the cost to many who hunt where snakes are plentiful.

Caps and Hats

Most hunters and shooters wear *caps* or *hats* at one time or another. Probably, more caps than hats are worn by shooters. Headgear is usually designed for one of three purposes. One is to shield the eyes so the hunter can see better. A second purpose is to provide warmth. Folding flaps or other devices give the hunter the option of protecting the forehead, ears, and upper neck. The third purpose is to protect the hunter. A blaze orange cap is easily seen by other hunters, and serves as an important safety precaution.

Caps are good "suggestion selling" items. A hunter will often respond in a positive way when reminded that a cap is an important hunting accessory.

Gloves

A hunter's hands and feet are hard to keep warm on a cold day. Cold hands become stiff, making it difficult for the hunter to work the gun's action or squeeze the trigger properly. Shooting gloves help to solve this problem (see fig. 22.6). They keep the hands and fingers warm. They also have a slit or a hole through which the trigger finger can be placed when the hunter is ready to shoot. Shooting gloves may seem to be a minor item, but they may mean the difference between missing and hitting the target.

Game Bags

Hunters of birds and small game need game bags for storing collected game. Hunting jackets or vests usually contain game bags. If not, the hunter can usually find a game bag that is in the form of a vest (see fig. 22.7). The game bags are usually coated inside with rubber or a similar covering. This protects the hunters clothing from blood that may collect in the bag. The outer covering is often ducking or canvas.

Protective Vests

Many hungers have jackets and caps that are blaze orange in color. If not, vests in this color are available to wear over regular clothing. These are lightweight and are not intended to provide warmth—they are only for protection.

Knives

Almost every hunter carries a knife. Knives used for hunting come in two styles. One is the *folding knife,* which can be carried in the pocket. Larger folding knives are carried in a leather

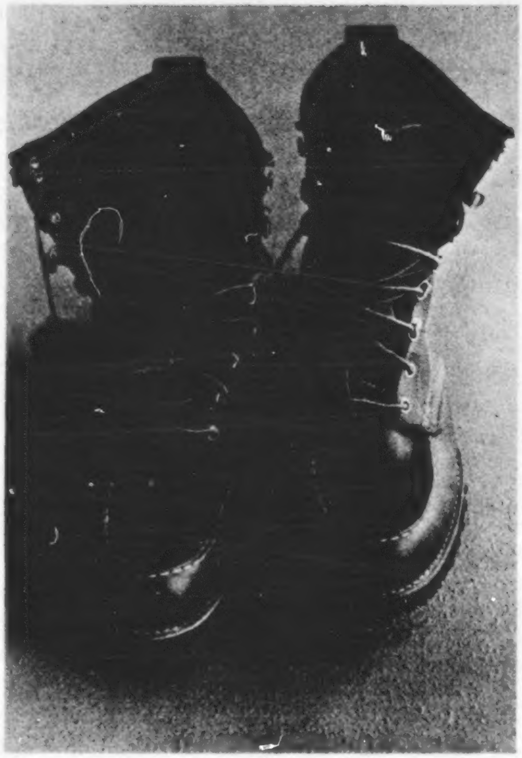
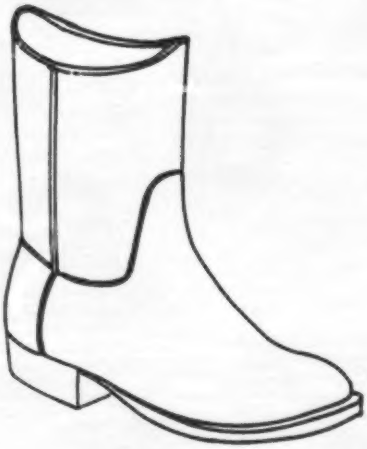


Fig. 22.5. Conventional Hunting Boots (Courtesy McBride's Gun Store, Austin, Texas)



Wellington boots

case worn on the belt. The other type of knife used has a rigid blade and is carried in a sheath. This type of knife is often called a *hunting knife* (see fig. 22.8).

A hunting knife must be designed efficiently. Most experienced hunters do not carry large Bowie knives. Most prefer knives with blades between 3½ and 4½ inches long. Smaller knives may be carried with hunting small game. Big game hunters need knives that are heavy enough to do the job. Field-dressing a deer, for example, means cutting through the pelvic bone. This takes a strong knife. The knife must be able to keep an edge so the hunter can skin the animal.

Most knives now have rustproof blades. The hunter should pay most attention to the strength of the knife and how well it takes an edge. Some stainless steel blades will not hold an edge. Carbon steel is good but will tarnish. Most knives of good quality now combine the advantages of carbon steel and stainless steel. Their blade will hold an edge but will not rust.

Bird hunters often buy a pair of shears or heavy scissors for the hunt. The shears easily cut through wing and leg bones while a bird is being dressed.

A knife is an important piece of equipment for the hunter. An inexpensive knife often will fail to perform as expected. Experienced hunters demand quality in the knives they use. A good knife is worth its price.

Gun Cleaning Kits

Hunters are concerned about keeping their guns in top condition. Gun-cleaning equipment includes several items. Kits are available which include rods, brushes, patches, and oil. The kits usually are prepared so the hunter can clean a particular gauge or caliber of gun. One manufacturer has produced a nylon rod that is covered with thousands of bristles. The rod is lightly oiled and pushed through the barrel, and the bristles do a good job of cleaning and oiling the barrel.

Sporting goods stores also carry gun oil that is used for metal parts of the gun. Oils which are rubbed into the stock to help it maintain its finish or appearance are also available. Full-line stores will probably carry bluing agents and other products needed by those doing extensive repair or touch-up work on their guns.

Decoys

Full-line sporting goods stores usually handle *decoys* of various types. Duck decoys usually come to mind when the word decoy is mentioned (see fig. 22.9). Although duck decoys represent the largest number of sales, other types of decoys are available. Dove hunters have found that a few dove decoys in a dead tree can be very effective. These often have a clothes pin-type mechanism for attaching the decoy to the tree limb.

Crow hunters sometimes use an owl decoy to attract crows. This decoy is placed in a tree or on a post where it can be seen by crows. More recently, wild turkey hunters are discovering that a female turkey decoy can attract tom turkeys. The hunter still needs to be able to produce a turkey call. However, the decoy improves the chance of drawing the tom turkey in close enough for a shot.

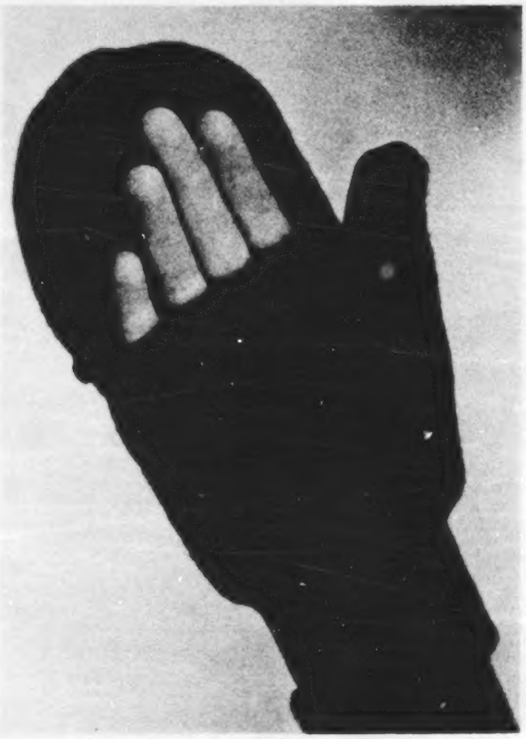


Fig. 22.6. *Shooting Gloves*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

Fig. 22.7. *Trap and Skeet Vest; also excellent dove vest*
(Courtesy Oshman's Sporting Goods, Austin, Texas)

Varmint Calls

Varmint hunting is a favorite sport for some hunters. *Calls* are available which produce noises that attract varmints. Most are operated by blowing into the call. Some are worked by hand. The calls often imitate the sounds of a rabbit in distress, which will draw most varmints. The hunter needs to know that it will also attract owls. Some hunters have been seriously injured by an owl that attacked the source of the sound of a wounded rabbit.

Other calls are electronic. Records or tapes may be used to imitate sounds that attract varmints. Many hunters feel electronic calls are unsportsmanlike, and several states have outlawed them. You will need to know your state's laws concerning this type of call.

Varmint hunters usually will need to use lights while hunting. Some just use large flashlights. Research has shown that an animal will not be as easily frightened if the hunter uses a red light instead of a white light. Many lights now produced for varmint hunters have red lenses.

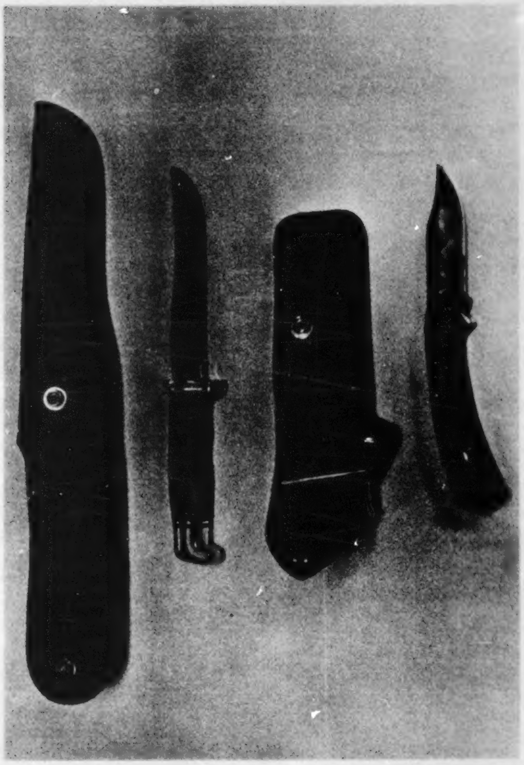


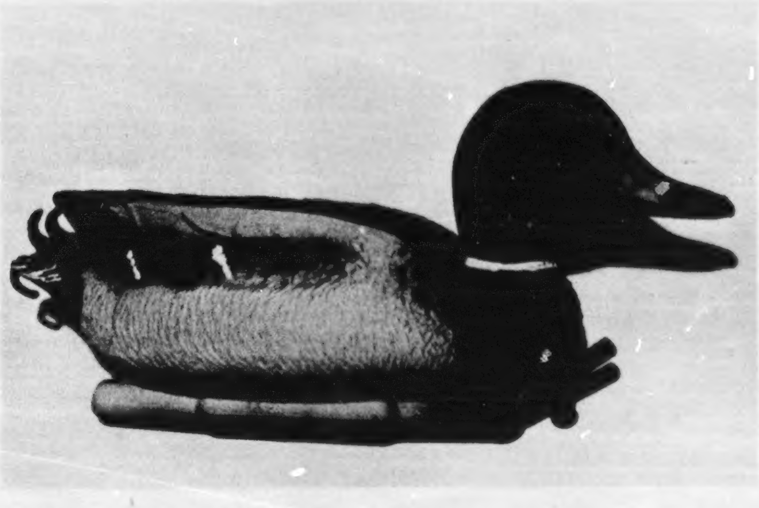
Fig. 22.8. Folding and Regular Hunting Knife (Courtesy Montgomery Ward, Austin, Texas)

Compasses

Anyone who hunts in unfamiliar country should carry a compass. Unless a good landmark is available to help determine a hunter's position, it's easy to get lost in the woods, plains, mountains, or anywhere else. In fact, it's possible to become lost even in country that someone has hunted in for years.

A compass can help the hunter find his way back to camp. Although a compass does not tell an exact position, by reading it as a hunter walks away from camp, he or she can then use

Fig. 22.9. Duck Decoy (Courtesy Oshman's Sporting Goods, Austin, Texas)



the compass for direction-finding on returning to camp.

A compass is an important piece of equipment. Just like knives, there are compasses of poor quality and those of good quality. This is one item on which the hunter should not try to economize. The compass should be of good quality, and it should also be easy to read.

Chairs and Stools

Hunting should be enjoyable. Some types of hunting involve a lot of walking. Other hunts may involve a lot of standing or waiting. Dove hunting around a field or pond often means staying in one spot for an entire afternoon. "Taking a stand" during a deer hunt may require trying to sit still for several hours. Some hunters have discovered that waiting for game is more comfortable while sitting on a chair or stool designed for that purpose (see fig. 22.10). Sitting on the ground, on a rock, or a stump becomes uncomfortable in a hurry. This is especially true if it is damp outside.

Some manufacturers produce lightweight stools or chairs that hunters can use. They must be light enough to carry to the stand, and they also must be strong enough to last a while. A stool or chair may sometimes be placed upon uneven ground. It must be well constructed to handle this stress. Chairs and stools made of tubular metal frames and canvas covering are good for hunting purposes.

Many other accessories are available to the hunter and competitive shooter. As you spend more time in your store, you will learn which accessories to suggest to your customers in order to make their hunts more pleasurable and more successful.

Questions

1. When is insulated clothing worn on a hunt?

2. What is the best insulation material for insulated clothing?

3. Is a jacket with a water-repellent finish waterproof?

4. What is a *poncho?*

5. Why do some hunters prefer the Wellington boot over the traditional hunting boot?

6. How do *shooting gloves* differ from other gloves?

7. Why does a deer hunter need a strong knife?

8. Do hunters ever use wild turkey decoys?

9. Should a hunter use a traditional flashlight when varmint hunting?

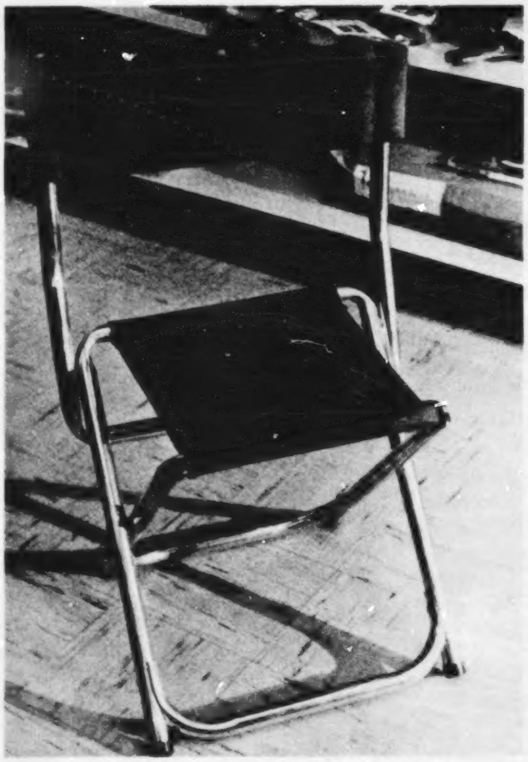


Fig. 22.10. Hunter's Canvas Stool (Courtesy Oshman's Sporting Goods, Austin, Texas)

Projects

Do a feature-benefit analysis sheet on each of the following:

1. a down-insulated coat
2. a rainsuit
3. a pair of hunting boots
4. a folding hunting knife
5. a chair or stool developed for use by hunters